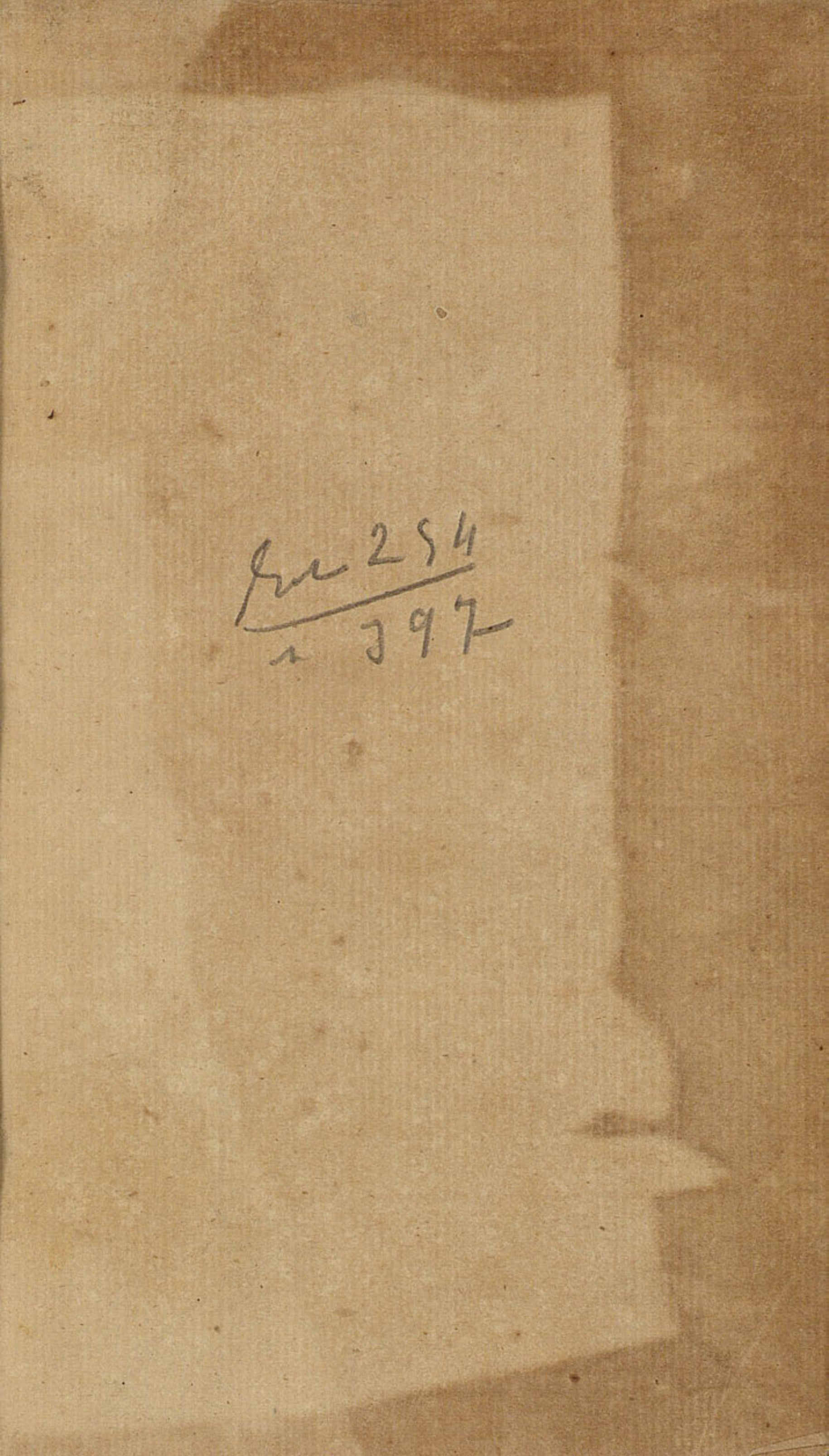

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A NEW AND COMPLETE

DICTIONARY

OF

ARTS and SCIENCES;

COMPREHENDING ALL

The Branches of Uſeful Knowledge,

WITH

ACCURATE DESCRIPTIONS as well of the various MACHINES, INSTRUMENTS, TOOLS, FIGURES, and SCHEMES neceſſary for illuſtrating them,

AS OF

The Claſſes, Kinds, Preparations, and Uſes of NATURAL PRODUCTIONS, whether ANIMALS, VEGETABLES, MINERALS, FOSSILS, or FLUIDS;

Together with

The KINGDOMS, PROVINCES, CITIES, TOWNS, and other remarkable Places throughout the WORLD.

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By a SOCIETY of GENTLEMEN.

The SECOND EDITION,
With many ADDITIONS, CORRECTIONS, and other IMPROVEMENTS.

———————*Huc undique Gaza*
Congeritur ——————— VIRG.

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M DCC LXIV.

A NEW AND COMPLETE

DICTIONARY

OF

ARTS and SCIENCES.

L, or l, the eleventh letter and eighth consonant of our alphabet. It is a semi-vowel, formed in the voice by intercepting the breath between the tip of the tongue and the fore-part of the palate, with the mouth open.

There is something of aspiration in its sound, and therefore the Britons usually double it, or add an *h* to it; as in *llan*, or *lhan*, a temple.

In english words of one syllable, it is doubled at the end; as in *all, wall, mill, wooll*, &c. but in words of more syllables than one, it is only single at the end; as in *foretel, proportional*, &c. It may be placed after most of the consonants, as in *blue, clear, flame*, &c. but before none of them.

As a numeral letter, L denotes 50; and with a dash over it, thus, $\overline{L}$, 50000. Used as an abbreviature, L stands for Lucius; and L. L. S. for a sesterce. See the article SESTERCE.

LA, in music, the syllable by which Guido denotes the last sound of each hexachord: if it begins in C, it answers to our A; if in G, to E; and if in F, to D.

LABARUM, in roman antiquity, the standard borne before the roman emperors; being a rich purple streamer, supported by a spear.

LABDANUM, or LADANUM, a resin of the softer kind, though of too firm a consistence to be ranked among the fluid ones. See the article RESIN.

There are two kinds of it kept in the shops; one usually imported in bladders, to preserve it in its genuine soft consistence, and to prevent the evaporation of its finer parts; another in rolls, much inferior to the former in purity and virtue.

Labdanum should be chosen soft and moist, of a strong smell, pure, very inflammable, and diffusing a fragrant smell while burning. It is a resinous juice which exsudates from a tree of the cistus-kind, and is collected in the following manner: they make a kind of wooden rake, but without teeth, and to this they affix a number of long thongs of untanned leather: this instrument they draw several times over the shrubs, during the heat of the day, and afterwards scraping off the resin from these thongs, put it up for use. What is collected pure and free from dust, is seldom sold so; the peasants, who sell it by weight, to increase their profit, usually mixing a kind of dusky coloured heavy sand among it.

In medicine it is used externally, to attenuate and discuss tumours; internally it is more rarely used, but it is greatly extolled by some against catarrhs, and in dysenteries: its dose, in these cases, is from five grains to thirty: it has been made an ingredient in several of the old compositions of the shops, but is at present much disused.

LABEL, in heraldry, a fillet usually placed in the middle along the chief of the coat, without touching its extremities. Its breadth ought to be a ninth part of the chief.

chief. It is adorned with pendants; and when there are above three of these, the number must be specified in blazoning.

This is a kind of addition to the arms of a second brother, to distinguish him from the first, and is esteemed the most honourable of all differences. See plate CLII. fig. 1.

Label, in law, a narrow slip of parchment hanging from a deed, writ, or other writing, in order to hold the appending seal. See the article Seal.

Label *of a circumferentor*, a long thin brass-ruler, with a sight at one end, and a center hole at the other; chiefly used with a tangent line, to take altitudes.

LABIAL letters, those pronounced chiefly by means of the lips. See the article Letter.

LABIATED flowers, monopetalous flowers, consisting of a narrow tube, with a wide mouth, divided into two or more lips. See Botany and Flower.

LABIAU, a port-town of Prussia, situated on a bay of the Baltic sea, twenty miles north-east of Koningsburg: east long. 22° 15′, north lat. 55°.

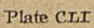
LABIUM, lip, in anatomy. See Lip.

LABORATORY, or Elaboratory, the chemists work-house, or the place where they perform their operations; where the furnaces are built, their vessels kept, &c. and in general, the term laboratory, is applied to any place where physical experiments, in pharmacy, chemistry, pyrotechny, &c. are performed. See the article Furnace, &c.

A principal obstacle to the general exercise of chemistry being the difficulty of procuring proper furnaces, vessels, utensils and materials for the purpose, a portable laboratory was introduced by Dr. Shaw, by means of which alone all the chemical operations may be commodiously performed. This laboratory consists of three parts, *viz.* a furnace, an apparatus, and a materia chemica. The furnace, an internal and external view of which is represented in plate CLI. has four principal parts. 1. The cover A, with its upright funnel. 2. The two rings BB. 3. The body C. And, 4. The foot D. The general office and use of the cover is to check, suppress, and throw back the heat and flame, or prevent the fuel from spending itself too fast, as it otherwise would do, with little effect in many operations. In order to encreasse the draught, and squeeze the air more forcibly through the body of the fuel, there is a moveable chimney F F, that may occasionally be fixed to the orifice left for that and other purposes in the top of the cover. The ring is the seat of numerous operations; the subject to be acted on by the fire being frequently lodged therein; and in other cases it helps to enlarge the furnace, and render it capable of operations, which it could not otherwise perform. The body serves to contain the fuel, and is the common seat of the fire. In many cases of fusion, as in running of metals from their ore, it performs at the same time the office of a crucible, and contains the subject mixed along with the fuel, after the manner practised in the smelting-houses. To this body belong three several grates, *a*, *a*, *a*, that may be placed at differents heights therein, according to the nature of the operation, and the distance required between the subject and the fire. Lastly, the foot, whereof there are two kinds, D and E, is not only of use in supporting the other parts, but also in receiving the ashes of the fuel and the melted matters that, by the fire, are made to flow and run down into it; and thus performing the office of a receiver, it is of singular use in collecting and preserving substances that might otherwise be spilt or lost.

The more immediate appurtenances of this furnace are fuel and bellows. The fuel may be charcoal; or as there is a contrivance for a vent or flew in the body of the furnace, common sea-coal may be employed, and the smoke directed up the chimney of the room where the furnace is to stand. Its structure is also well fitted for a lamp, which in many cases, as particularly some curious digestions and calcinations, is highly necessary; and by this means also may the operations which would otherwise require the athanor, or a long continued uniform heat, be elegantly performed.

It would be tedious to shew how all the numerous operations of chemistry are performable by means of this furnace: it may suffice to consider the general states or conditions into which the instrument may be put for the principal of them. The simplest state of this furnace is a combination of two parts, the body and the foot, which is thus fit for fusion, by the naked fire, when the matter to be melted is mixed among the fuel, as in running the ores of lead, tin, or iron, for instance. By barely placing the middle grate



the Furnace of the portable LABORATORY

F

A

E

B

B

D

a

a

C

a

A

D

F

a

C

B

J. Jeffery sculp



grate in the body, the instrument becomes a melting-furnace for a crucible. When only the body of the furnace with its middle grate is set upon the foot, it answers all the ends of the common shop-furnace of the apothecaries for decoctions, inspissations, extraction, &c. and the purposes of a naked fire for certain distillations, sublimations, and the like. It may moreover be readily converted into a balneum mariæ, an ash-pot, a sand-heat, or a still stronger for digestion, &c. by barely setting upon it a pan of water, ashes, sand, or iron-filings. If instead of a common pan, the ring furnished with its set of pots be set upon the body with its grate, you have a furnace fitted for distillation in capella vacua, where the retorts are contained in the cavity of the pots, and locked down therein without any visible medium between. An iron-pan placed in the room of the ring just mentioned, makes a calcining furnace; the lowest grate being used, either a cold still or a hot one may be put into the body, and worked as in the common manner, with its proper head and refrigeratory. The application of the cover to the hollow ring, and sometimes to the body without the ring, makes a proper reverberatory furnace.

The outer case of this furnace is best made of plated iron, formed in separate pieces of the figures expressed in the plate, and of such a size as the operator shall choose, observing the same proportion between the parts as the plate exhibits: the inner side of all the parts are to be lined, the thickness of an inch at least, with a proper luting.

All the chemical apparatus may be divided into remote and intermediate, or such as is preparatory to the operations, and such as is actually employed therein: the remote apparatus of this portable furnace consists of scales, weights and measures; also mortars, sieves, rasps, files, hammers, sheers, and forceps. Next to these are the instruments for managing the fire, as shovels, hooks, tongs, and blow-pipes. Also for charging the vessels with the subject matters of the operations, as shells, horns, tin-plates, brushes, hares-feet, &c. also for emptying the productions, hooked tongs, ingots, cones, basons, funnels, &c. In the last place come the instruments for making certain utensils, as cores for muffles, moulds for tests, crucibles and melting-pots, and irons for cutting glasses and the necks of retorts. For a proper description of these instruments, utensils, &c. see each under its proper head.

The materia chemica, that is the subject to be worked upon or immediately and materially employed in chemical operations, is the next thing to be considered as the constituent parts of a laboratory: this is a large field, and comprehends all the natural bodies on our globe, which are all subject matters of chemistry; and are all separately treated of under their proper heads through the course of this work.

LABOUR, in general, denotes a close application to work or business. Among seamen a ship is said to be in labour, when she rolls and tumbles very much, either a hull, under sail, or at anchor. It is also spoke of a woman in travel, or child-birth. See DELIVERY.

LABOURER, generally signifies one that does the most slavish and less artful part of a laborious work, as that of husbandry, masonry, &c.

An antient statute ordains, that the wages of labourers shall be yearly assessed by the sheriff and justices of the peace of every county in the easter-sessions; and in corporations, by head officers; and if they take work by the great, and leave the same unfinished, except it be for the non-payment of wages, or where they are employed in the king's service, &c. they shall be imprisoned one month, and forfeit 5 l. The hours that labourers shall work in the day are also appointed, on pain of forfeiting one penny for every hour's absence: and all labourers may be compelled to serve by the day in the time of corn and hay-harvest.

LABRADOR, also called New Britain, and Eskimaux, is a country in North America, bounded by Hudson's Straits and the Atlantic Ocean, on the north; by the same ocean, on the east; by the river of St. Lawrence and Canada, on the south; and by Hudson's bay, on the west: situated between 59° and 79° of west long. and between 50° and 64° of north lat.

LABRAX, in ichthyology, a species of pearch, with fourteen rays in the fin besides the anus. See PEARCH.

LABRUS, in ichthyology, a genus of acanthopterygious fishes, with six bony rays in the membrane of the gills; add to this, that the lips are thick, and the rays of the back-fin anteriorly double.

The name labrus is given to the fishes of this

this genus, on account of the thicknefs of their lips.

LABURNUM, in botany, is only a fpecies of cytifus. See CYTISUS.

LABYRINTH, in anatomy, the internal cavity of the ear, fo called from finuofities and windings. See EAR.

LABYRINTH, in gardening, a winding mazy walk between hedges, through a wood or wildernefs. The chief aim is to make the walks fo perplexed and intricate, that a perfon may lofe himfelf in them, and meet with as great a number of difappointments as poffible. They are rarely to be met with, except in great and noble gardens, as Verfailles, Hampton court, &c.

There are two ways of making them; the firft is with fingle hedges: this method has been practifed in England: and thefe may, indeed, be beft, where there is but a fmall fpot of ground allowed for making them; but where there is ground enough, the double is moft eligible. Thofe made with double hedges, with a confiderable thicknefs of wood between them, are approved as much better than fingle ones: this is the manner of making them in France and other places; of all which that of Verfailles is allowed to be the nobleft of its kind in the world. It is an error to make them too narrow; for that makes it neceffary to keep the hedges clofe clipt: but if, according to the foreign practice, they are made wide, they will not ftand in need of it. The walks are made with gravel ufually fet with horn-beam: the palifades ought to be ten, twelve, or fourteen feet high: the hornbeam fhould be kept cut, and the walks rolled.

LAC, MILK, among phyficians, &c. See the article MILK.

The appellation lac is alfo given to feveral chemical preparations, as, 1. Lac ammoniaci, which is ordered by the college to be made in the following manner: take of gum ammoniac, two drams; of fimple penny-royal water, half a pint; and rub the gum in a mortar with the water, till it is diffolved, which it will do without heat. 2. Lac fulphuris, called alfo precipitated fulphur. See SULPHUR.

LAC LUNÆ, in natural hiftory, a name fometimes given to mineral agaric. See the article AGARIC.

LACCA, in natural hiftory, &c. a vegetable production, improperly called gum, as being inflammable, and not foluble in water.

There are three kinds of lacca kept in the fhops, which are all the products of a fpecies of ziziphus. See ZIZIPHUS. The ftick-lacca is a hard, refinous, and friable fubftance, of an uneven and granulated furface, and of a roundifh but fomewhat dufky colour. It is of an auftere and fubaftringent tafte, and is fixed round certain fticks, and branches of a woody fubftance. The feed-lacca is brought to us in loofe grains, or little maffes, of a roundifh irregular figure, and of a reddifh colour, which feem no way different from the ftick-lacca, but as parts from the whole. The third kind, or fhell-lacca, is met with in thin and tranfparent cakes, made by melting the above granules, or what is taken from the fticks, into a mafs. Some affirm that it exfudes from the jujube, and feveral other trees of the fame genus; but others affert that it is no vegetable exfudation at all, but a fubftance analogous to wax laid on thefe branches by infects. Till we have fome very good obferver on the fpot, to determine between the pofitive affertions of the feveral authors who have wrote upon it, we muft be contented to reft in uncertainty: but whatever may be the hiftory of this drug, its virtues are lefs in difpute; it is an attenuant, aperient, and diuretic, and is fometimes prefcribed in diforders of the liver and fpleen, and in jaundices and dropfies. It would probably be in more ufe, if we knew how to open its body, fo as to make it exert its virtues; for it is a fort of unchangeable medicine which paffes the body very little altered, if given in fubftance; and it is of the number of thofe things from which a tincture is very difficultly extracted. But befides thefe virtues, a beautiful red colour is prepared from it by only boiling ftick-lacca in water, and then filtrating the decoction, and evaporating the fuperfluous humidity. This lacca is of great ufe in painting, on which account its name has been given to feveral colours procured from other ingredients in much the fame manner.

Artificial LACCA, or LAKE, a colouring drug obtained from certain vegetables. Of thefe there are different kinds. 1. To make a fine red lake: take half a pound of good brazil, boil it in three pints of lye, made of the afhes of vine fprigs, till it be half evaporated, then let it fettle and ftrain it off. Then boil it again with frefh brazil, a quarter of a pound; cochineal,

cochineal, two pounds; and terra merita, half an ounce; adding to it a pint of fair water; let it boil till it be half evaporated as before, then set it by to settle and strain it. But when you take it off the fire, put in half an ounce of burnt alum reduced to an impalpable powder; let it dissolve, stirring it with a stick, and add to it a quarter of a dram of arsenic. In order to give it a body, reduce two cuttle-fish bones to a fine powder, put it in, and leave it to dry at leisure, and then grind it with a good quantity of fair water, in which leave it to steep; afterwards strain it through a cloth, make it up into small cakes, and set them to dry on cards or paste-board. If you would have this lake redder, add to it lemon-juice; and if you would have it deeper, add to it oil of tartar. 2. To make columbine-lake: steep half a pound of the finest brazil-wood of Fernambouc, rasped in three pints of the most subtilely distilled vinegar, for at least a month, and if it be for six weeks, it will be the better. After which, boil all in balneo mariæ for about a minute, and leave it for a day or two; after which, put a quarter part of alum-powder into a very clean earthen pan, and strain the liquor upon it through a cloth, and so let it remain for a day; then heat the whole till it simmers, and leaving it again for twenty-four hours, reduce two cuttle-fish bones into powder, and having warmed the liquor, pour it upon them; then stir the whole with a stick till it is cool, and leave it again for twenty-four hours before you strain it. 3. To make lake of turmeric: take a pound of turmeric-root, reduced to a fine powder, three pints of fair water, and an ounce of salt of tartar; put them into a glazed earthen vessel, and let them boil together gently over a clear fire, till the water appears richly impregnated with the turmeric, or will stain a piece of white paper beautifully yellow; then filter the liquor, and gradually add to it a strong aqueous solution of roach-alum, till the yellow matter is all curdled together, or precipitated; after this filtre the whole through paper, when the aqueous part will run off, and leave a yellow matter behind; which being edulcorated, or washed in the filtre, by the repeated affusion of fresh water, till the water comes away insipid; and being afterwards dried, it becomes a beautiful yellow for painting.

LACE, in commerce, a work composed of many threads of gold, silver or silk, interwoven the one with the other, and worked upon a pillow with spindles, according to the pattern designed. The open work being formed with pins, which are placed and displaced as the spindles are moved. See the article GOLD-THREAD.

The importation of gold and silver-lace is prohibited.

Bone-LACE, a lace made of fine linen thread or silk, much in the same manner as that of gold and silver. The pattern of the lace is fixed upon a large round pillow, and pins being stuck into the holes or openings in the pattern, the threads are interwoven by means of a number of bobbins made of bone or ivory, each of which contains a small quantity of fine thread, in such a manner as to make the lace exactly resemble the pattern. There are several towns in England, and particularly in Buckinghamshire, that carry on this manufacture; but vast quantities of the finest laces have been imported from Flanders.

The duties on foreign bone-lace are as follow: bone-lace of thread, the dozen yards pays, on importation, 15 s. $4\frac{80}{100}$d. and draws back, on exportation, 13s. 6d. Purl or antlet-lace of thread, the groce, pays 3 s. $10\frac{20}{100}$d. Silk bone-lace the pound, containing sixteen ounces, pays 11 l. 10 s. $10\frac{1}{2}$ d.

LACE is also used for a kind of chord made of silk or cotton, chiefly used in lacing womens stays.

LACEDEMON, the antient name of Misithra. See the article MISITHRA.

LACERTA, the lizard, in zoology. See the article LIZARD.

LACHNÆA, in botany, a genus of the octandria-monogynia class of plants, without any flower petals: there is no pericarpium; the seed, which is single, oval, and obliquely acute, being contained in the bottom of the cup. It differs from the passerina only in having its cup divided into unequal segments.

LACHNIS, in natural history, a genus of fibrariæ; being fibrose, unelastic bodies, composed of short or abrupt filaments. See the article FIBRARIÆ.

LACHRYMAL, in anatomy, an appellation given to several parts of the eye, from their serving to secrete the tears. The lachrymal gland is situated in the orbit above the smaller angle, and its excretory ducts under the upper eye-lid: these are much more easily demonstrated in

in the eye of an ox, than in a human one. The lachrymal caruncle is ſituated in the larger angle, or canthus, ſerving to direct the tears to the two puncta lachrymalia; which are ſituated in the ſame angle, at the extremities of the tarſi or cartilages, and terminate in the lachrymal ſaccus, the naſal canal, and in the noſe itſelf. See the article EYE.

LACHRYMALIS FISTULA, in ſurgery and medicine. See FISTULA.

LACHRYMATORY, in antiquity, a veſſel wherein were collected the tears of a deceaſed perſon's friends, and preſerved along with the aſhes and urn.

LACINIATED-LEAF, among botaniſts, expreſſes a leaf which has ſeveral ſinuſes down to the middle, and, the lobes which ſeparate theſe not ſmooth but notched, or indented. See LEAF.

LACONISM, λακωνισμος, in matters of ſtyle, a ſhort, pithy obſervation or ſaying; ſo called from the Lacedæmonians, who were remarkable for the conciſeneſs of their diſcourſe. See STYLE.

LACRYMAL, or LACHRYMAL. See the article LACHRYMAL.

LACTEA, or VIA LACTEA, the ſame with galaxy. See GALAXY.

LACTEAL VESSELS, in anatomy, fine ſubtile canals ſituated in the inteſtines and meſentery, and ſerving to convey the chyle to its deſtined place. See the the article CHYLE.

Aſellius, who demonſtrated them in 1622, has the honour of paſſing for the firſt diſcoverer of them; but they were long before obſerved by Eraſiſtratus and Galen, who took them for arteries containing milk.

The moſt convenient method of demonſtrating them, is in comparative anatomy, by feeding ſome animal plentifully; and, in about three hours afterwards, ſtrangling it. In this caſe, they are all turgid with chyle: whereas, at other times, they are filled with a lymphatic juice, not with chyle; and accordingly are called lymphatics, not chyliferous veſſels.

The origin of theſe veſſels is from the inteſtines, and principally from the ſmall ones: in all theſe they are extremely numerous, but few or none of them can be ſeen in the larger guts.

Anatomiſts diſtinguiſh two kinds of them, which they call lacteals of the firſt and ſecond order. Thoſe of the firſt order, are ſuch as run from the inteſtines to the glands of the meſentery: thoſe of the ſecond order, are ſuch as run from the glands to the receptacles and thoracic duct, where they terminate. Theſe laſt are larger than the former, but they are fewer in number. See DUCT, THORACIC, CHYLIFICATION, &c.

LACTIFEROUS, an appellation given to plants abounding with a milky juice, as the ſow-thiſtle, and the like.

LACTUCA, LETTUCE, in botany. See the article LETTUCE.

LACUNÆ, in anatomy, certain oſcular orifices, proceeding from the glandulæ ſubſtratæ in the vagina, and often ſo large as to admit a briſtle. Their uſe is to ſecrete a fluid for lubricating the vagina, and ſtimulating to venery.

LACUNAR, in architecture, an arched roof or ceiling, more eſpecially the planking or flooring above porticos and piazzas.

LADANUM, or LABDANUM, in pharmacy. See the article LABDANUM.

LADENBURG, a town of Germany, ſituated on the river Neckar, eight miles north-weſt of Heidelburg.

LADING, in merchandize, &c. taken into a ſhip, for which the maſter gives a bill of lading. See the article BILL.

LADOGA LAKE, in ruſſian Finland, communicates with the gulph of Finland by the river Nieva.

LADOGNA, or LACEDOGNA, a city and biſhop's ſee of the kingdom of Naples, fifty-five miles eaſt of the city of Naples.

LADRONE ISLANDS, are ſituated in the Pacific Ocean, between 12° and 28° of north lat. and about 140° eaſt long.

LADY's BEDSTRAW, a plant called by botaniſts gallium. See GALLIUM.

LADY's BOWER, the ſame with clematis, or virgin's bower.

LADY-COW, in zoology. See the article HEMISPHÆRIA.

LADY's COMB, a plant otherwiſe called ſcandix. See the article SCANDIX.

LADY's MANTLE, the engliſh name of the alchimilla. See ALCHIMILLA.

LADY's SEAL, a name by which ſome call tamnus. See the article TAMNUS.

LADY's SMOCK, the engliſh name of cardamine. See the article CARDAMINE.

LADY's SLIPPER, the engliſh name of the cypripedium. See CYPRIPEDIUM.

LADY's TRACES, a name by which ſome call orchis. See the article ORCHIS.

LADY-DAY, in law, the 25th of March, being the annunciation of the holy virgin. See ANNUNCIATION.

LAGAN, or LAGON, in law. See the article FLOTSON.

LAGANUM, in natural hiftory, a genus of the echini marini, or centronia, with their mouth in the middle of the bafe of the fhell. See CENTRONIA.

LAGOCEPHALUS, in ichthyology, a fpecies of globe-fifh, fo called from its head being fomething like that of a hare. See the article ORBIS.

LAGOECIA, ROUND-HEADED CUMMIN, in botany, a genus of the pentandria-monogynia clafs of plants, the flower of which confifts of five petals, very fhort, and bicornate: there is no pericarpium, the feed, which is fingle, being contained in the cup.

This plant has neither the fmell, appearance, or tafte of cummin; its fmell being more like that of the carrot.

LAGOPHTHALMIA, in furgery, an everfion and gaping of the eye-lids, otherwife called ectropium. See the article ECTROPIUM.

LAGOPUS, in ornithology, a fpecies of tetrao, the whole body of which, excepting the tail, is white; the tail too is white, or at leaft tipped with white. It is about the fize of a tame pigeon.

LAGOS, a port-town of Portugal, in the province of Algarva: weft long. 9° 27′, north lat. 36° 45′.

LAGURUS, in botany, a genus of the triandria-digynia clafs of plants, the flower of which confifts of two oblong valves, and ferves as a pericarpium to inclofe the feed, which is fingle and ariftated.

LAHOLM, a port-town of Gothland, in Sweden, fixty miles north of Copenhagen.

LAHOR, the capital of a province of the fame name in the hither India: eaft long. 75°, and north lat. 33°.

LAIR, among fportfmen, the place where the deer harbour by day. This term is alfo ufed to fignify a place where cattle ufually reft under fome fhelter: by which means the ground generally becomes enriched with their dung.

LAKE, a collection of waters contained in fome cavity in an inland place, of a large extent, furrounded with land, and having no communication with the ocean.

Lakes may be divided into four kinds. 1. Such as neither receive nor fend forth rivers. 2. Such as emit rivers, without receiving any. 3. Such as receive rivers, without emitting any. And 4. Such as both receive and fend forth rivers. Of the firft kind, fome are temporary and others perennial: moft of thofe that are temporary owe their origin to the rain, and the cavity or depreffion of the place in which they are lodged: thus in India there are feveral fuch lakes made by the induftry of the natives, of which fome are a mile, and fome two in circuit; thefe are furrounded with a ftone wall, and being filled in the rainy months, fupply the inhabitants in dry feafons, who live at a great diftance from fprings or rivers. There are alfo feveral of this kind formed by the inundations of the Nile and the Niger; and in Mufcovy, Finland, and Lapland, there are many lakes formed partly by the rains and partly by the melting of the ice and fnow: but moft of the perennial lakes which neither receive nor emit rivers, probably owe their rife to fprings at the bottom, by which they are conftantly fupplied. The fecond kind of lakes, which emit, without receiving rivers, is very numerous. Many rivers flow from thefe as out of cifterns; where their fprings being fituated low within a hollow place, firft fill the cavity and make it a lake, which not being capacious enough to hold all the water, it overflows and forms a river: of this kind is the Wolga, at the head of the river Wolga; the lake Odium, at the head of the Tanais; the Adac, from whence one branch of the river Tigris flows; the Ozero, or White lake in Mufcovy, is the fource of the river Shackfna. The great lake Chaamay, which emits four very large rivers, which water the countries of Siam, Pegu, &c. *viz.* the Menan, the Afa, the Caipoumo, and the Laquia, &c.

The third fpecies of lakes, which receive rivers but emit none, apparently owe their origin to thofe rivers which in their progrefs from their fource, falling into fome extenfive cavity, are collected together, and form a lake of fuch dimenfions, as may lofe as much by exhalation, as it continually receives from thefe fources: of this kind is that great lake improperly called the Cafpian fea; the lake Afphaltites, alfo called the Dead fea; the lake of Geneva, and feveral others.

Of the fourth fpecies, which both receive and emit rivers, we reckon three kinds, as the quantity they emit is greater, equal, or lefs than they receive. If it be greater, it is plain that they muft be fupplied by fprings at the bottom; if lefs, the furplus of the water is probably

ſpent in exhalations; and if it be equal, their ſprings juſt ſupply what is evaporated by the ſun.

Lakes are alſo divided into thoſe of freſh water, and thoſe of ſalt. Dr. Halley is of opinion, that all great perennial lakes are ſaline, either in a greater or leſs degree; and that this ſaltneſs encreaſes with time: and on this foundation he propoſes a method for determining the age of the world.

Large lakes anſwer the moſt valuable purpoſes in the northern regions, the warm vapours that ariſe from them moderating the pinching cold of thoſe climates; and what is ſtill a greater advantage, when they are placed in warmer climates at a great diſtance from the ſea, the exhalations raiſed from them by the ſun, cauſe the countries that border upon them to be refreſhed with frequent ſhowers, and conſequently prevent their being barren deſarts.

LALAND, an iſland of Denmark, ſituated ſouth of Zeland, from which it is ſeparated by a narrow canal: eaſt long. 12°, north lat. 55°.

LAMA, the ſovereign pontiff or rather god of the aſiatic Tartars, inhabiting the country of Barantola. The lama is not only adored by the inhabitants of the country, but alſo by the kings of Tartary, who ſend him rich preſents, and go in pilgrimage to pay him adoration, calling him *lama-congiu*, i. e. god the everlaſting father of heaven. He is never to be ſeen but in a ſecret place of his palace, amidſt a great number of lamps, ſitting croſs legged upon a cuſhion, and adorned all over with gold and precious ſtones; where, at a diſtance, they proſtrate themſelves before him, it not being lawful for any to kiſs even his feet. He is called the great lama, or lama of lamas, that is, prieſt of prieſts. And to perſuade the people that he is immortal, the inferior prieſts, when he dies, ſubſtitute another in his ſtead, and ſo continue the cheat from generation to generation. Theſe prieſts perſuade the people, that the lama was raiſed from death many hundred years ago, that he has lived ever ſince, and will continue to live for ever.

LAMB, in zoology, the young of the ſheep-kind. See the article SHEEP.

A male lamb of the firſt year is called a wedder-hog, and the female, a ewe-hog; the ſecond year it is called a wedder, and the female a ſheave. If a lamb be ſick, mare's milk with water may be given it; and by blowing into the mouth, many have been recovered after appearing dead. The beſt ſeaſon for weaning them, is when they are ſixteen or eighteen weeks old; and about Michaelmas, the males ſhould be ſeparated from the females, and ſuch males as are not deſigned for rams, gelded.

LAMBALLA, a town of France, twenty-three miles ſouth-weſt of St. Malo.

LAMBDOIDES, in anatomy, one of the ſutures of the ſkull. See SKULL.

LAMBESSE, a town of Provence, in France, nine miles north of Aix.

LAMEGO, a city of Portugal: weſt long. 8° 6′, north lat. 41° 15′.

LAMELLÆ, in natural hiſtory, denotes very thin plates, ſuch as the ſcales of fiſh are compoſed of.

LAMENESS, among farriers. See the article HALTING.

LAMENTATIONS, a canonical book of the Old Teſtament, written by the prophet Jeremiah. The two firſt chapters of this book are employed in deſcribing the calamities of the ſiege of Jeruſalem. In the third, the author deplores the perſecutions he himſelf had ſuffered. The fourth turns upon the deſolation of the city and temple, and the misfortune of Zedekiah. The fifth chapter is a prayer for the Jews in their diſperſion and captivity; and at the end of all, he ſpeaks of the cruelty of the Edomites, who had inſulted Jeruſalem in her miſery. The four firſt chapters of the lamentations are an abecedary, every verſe or couplet beginning with one of the letters of the hebrew alphabet, in the alphabetical order. The ſubject is of the moſt moving kind, and the ſtile throughout lively, pathetic, and affecting. "Did we ever find, ſays "Dr. South, ſorrow flowing forth in "ſuch a natural prevailing pathos, as in "the Lamentations of Jeremy? One "would think, that every letter was "wrote with a tear; that every word "was the noiſe of a breaking heart; "that the author was a man compacted "of ſorrows, diſciplined to grief from "his infancy; one who never breathed "but in ſighs, nor ſpoke but in a groan."

LAMIA, in ichthyology, a name given to the white ſhark. See SHARK.

LAMIÆ, in heathen mythology, a kind of dæmons, in the form of women, ſaid to have devoured children. See DÆMON.

LAMINÆ, in phyſiology, the thin plates whereof many ſubſtances conſiſt.

LAMIODONTES, in natural hiſtory, the ſame

same with the glossopetra. See the article GLOSSOPETRA.

LAMIUM, DEAD NETTLE, in botany, a genus of the didynamia gymnospermia class of plants, the flower of which consists of one labiated and ringent petal: the seeds are four, triangular, and contained in the bottom of the cup.

The flowers of this plant are said to be good in the fluor albus, dysentery, and scrophulous disorders. The herb is aperient, emollient, and vulnerary.

LAMMAS-DAY, a festival celebrated on the first of August by the romish church, in memory of St. Peter's imprisonment.

LAMP, λαμπας, a vessel containing oil, with a lighted wick. See the articles OIL, FLAME, FIRE, &c.

Dr. St. Clair, in Phil. Transf. n° 245, gives the description of an improvement upon the common lamp. He proposes that it should be made two or three inches deep, with a pipe coming from the bottom almost as high as the top of the vessel: let it be filled so high with water as to cover the hole of the pipe at the bottom, that the oil may not get in at the pipe, and so be lost. Then let the oil be poured in, so as to fill the vessel almost brim full, which must have a cover pierced with as many holes as there are wicks designed. When the vessel is thus filled, and the wicks are lighted, if water falls in by drops at the pipe, it will always keep the oil at the same height, or very near; the weight of the water being to that of the oil as $20\frac{8}{11}$ to 19, which in two or three inches makes no great difference. If the water runs faster than the oil wastes, it will only run over at the top of the pipe, and what does not run over will come under the oil, and keep it at the same height.

Rolling-LAMP, a machine AB (plate CLII. fig. 2.) with two moveable circles D E, F G, within it; whose common center of motion and gravity is at K, where their axis of motion cross one another. If the lamp K C, made pretty heavy and moveable about its axis H I, and whose center of gravity is at C, be fitted within the inner circle, the common center of gravity of the whole machine will fall between K and C; and by reason of the pivots A, B, D, E, H, I, will be always at liberty to descend: hence, though the whole machine be rolled along the ground, or moved in any manner, the flame will always be uppermost, and the oil cannot spill.

It is in this manner they hang the compass at sea, and thus should all the moon-lanterns be made, that are carried before coaches, chaises, and the like.

LAMP BLACK, among colourmen. See the article BLACK.

LAMPADARY, an officer in the antient church of Constantinople, so called from his employment, which was to take care of the lamps, and to carry a taper before the emperor or patriarch when they went to church, or in procession.

LAMPAS, LAMPERS, or LAMPRASS, among farriers, a swelling and inflammation in the roof of a horse's mouth, so called because it is cured by burning with a lamp or hot iron, in which operation great care should be taken not to touch the bone.

LAMPERN, in ichthyology, a species of petromyzon, with a single row of little teeth in the verge of the mouth, beside the lower large ones. It grows to about a foot long, though most of those usually caught are under that standard. See the article PETROMYZON.

LAMPREY, *lampetra*, another species of petromyzon, with about twenty rows of teeth. It grows to two feet and an half, or more in length. It is caught in some large rivers near the sea, but is much less frequent than the former species.

LAMPSACUS, a port-town of the lesser Asia, at the entrance of the Propontis, opposite to Gallipoli, situated eighty miles south-west of Constantinople: east long. 28°, north lat. 40° 12′.

LANCASTER, the county-town of Lancashire: west long. 2° 44′, north lat. 54°. It sends two members to parliament.

LANCEOLATED LEAF, one resembling a spear's point.

LANCET, a chirurgical instrument, sharp-pointed, and two-edged, chiefly used for opening veins in the operation of phlebotomy, or bleeding; also for laying open abcesses, tumours, &c.

A surgeon should never be without some of these of different sizes. See two represented in plate CLII. fig. 3.

LANCHANG, the capital of the kingdom of Laos, in the further India: east long. 101°, north lat. 20°.

LANCIANO, a city of Italy, in the kingdom of Naples, situated near the gulph of Venice: east long. 15° 25′, north lat. 42° 20′.

LAND, in a limited sense, denotes arable ground. See the articles EARTH, SOIL, HUSBANDRY, &c.

It is alfo ufed for meadow-ground, pafture, wood, commons, &c. See the articles MEADOW, PASTURE, &c.

LAND, in the fea-language, makes part of feveral compound terms; thus *land laid*, or to lay the land, is juft to lofe fight of it. *Land-locked*, is when land lies all round the fhip, fo that no point of the compafs is open to the fea: if fhe is at anchor in fuch a place, fhe is faid to ride land-locked, and is therefore concluded to ride fafe from the violence of winds and tides. *Land mark*, any mountain, rock, fteeple, tree, &c. that may ferve to make the land known at fea. *Land is fhut in*, a term ufed to fignify that another point of land hinders the fight of that the fhip came from. *Land to*, or the fhip lies land to, that is, fhe is fo far from fhore that it can only be juft difcerned. *Land-turn*, is a wind that in almoft all hot countries blows at certain times from the fhore in the night. *To fet the land*, that is, to fee by the compafs how it bears.

LANDAFF, a city and bifhop's fee of Glamorganfhire, in fouth Wales, twenty-fix miles north-weft of Briftol: weft long. 3° 20′, north lat. 51° 33′.

LANDAU, a city of Germany, in the circle of the Upper-Rhine, and landgravate of Alface, fituated fifteen miles fouth-weft of Spire: eaft long. 8°, north lat. 49° 12′.

LANDEN, a fmall town of the auftrian Netherlands, in the province of Brabant, eighteen miles fouth eaft of Louvain, and twenty miles north of Namur.

LANDGRAVE, the german name for a count or earl, that has the government of a province, country, or large tract of land.

LANDGRAVIATE, or LANDGRAVATE, the office, authority, jurifdiction, or territory of a landgrave.

LANDRECY, a town of the french Netherlands, in the province of Hainault: eaft long. 3° 25′, north lat. 50° 5′.

LANDSCROON, a port-town of Sweden, in the province of Gothland, and territory of Schonen, fituated on the Baltic fea, within the Sound: eaft long. 14° 20′, north lat. 55° 42′.

LANDSHUT, a city of Germany, and the capital of Lower Bavaria, fituated forty miles north-eaft of Munich: eaft long. 12° 6′, north lat. 48° 30′.

LANDSKIP, or LANDSCAPE, in painting, the view or profpect of a country, extended as far as the eye will reach. Landfkips are efteemed one of the loweft branches of painting, reprefenting fome rural fcene, as hills, valleys, rivers, country-houfes, &c. where human figures are only introduced as accidents.

In painting landfkips the following rules will be found of ufe. 1. Always exprefs a fair horizon, fhewing the heavens cloudy or clear, more or lefs, according to the occafion; and if the fun is expreffed at all, let it be either at rifing or fetting, and as it were behind or over fome hill. The moon and ftars are feldom or never depicted, unlefs in twilight-pieces, becaufe all things are fuppofed to be feen by day. 2. Obferve to make the fun's light reflect upon all the objects the fame way, and the fhadows to fall the contrary way. 3. Take care to augment or leffen things proportionally, as they are fuppofed to be nearer or farther from the eye. 4. In expreffing things at large diftances, as ten, twenty, or thirty miles off, where the object is hard to be difcerned; as whether it be temple, caftle, houfe, or the like, fhew no particular figns thereof, or any eminent diftinction, but rather as weakly, faintly, and confufedly, as the eye judges of it. 5. If landfkips be laid in colours, the farther you go, the more you muft lighten it with a thin and airy blue, to make it feem as if it were afar off, beginning at firft with a dark green, fo driving it by degrees into a blue, according to the diftance. 6. Make your landfkip to fhoot, as it were, one part lower than another, making the neareft place or hill higheft, and thofe that are farther off to fhoot away under that, that the landfkip may appear to be taken from the top of an hill. 7. Let every thing have its proper motion, as in trees when they are fhaken with the wind, making the fmaller boughs yielding, the ftiffer lefs bending; in clouds, that they follow the winds; in rivers, the general current, and flafhing of the waters againft the boat-fides. 8. In the fea, the waves and other proper agitations, the rolling of the billows, the tumbling of veffels up and down, the fhips floating, fome dipt, fome half drowned, fome ftanding almoft an end, fome hid almoft with the waves, by means of the uncertainty of the furges, others endeavouring to live. 9. In the motion of waters falling from an high place, but efpecially when they fall upon rocks and ftones, you muft reprefent it leaping up into the air, and fprink-

ſprinkling all about: laſtly, let every thing that moves, whether eſſentially or accidentally, have its proper repreſentation. 10. Let the work imitate the ſeaſon it is intended to repreſent; as if you intend it for a winter-piece, repreſent felling of woods, ſliding upon the ice, fowling by night, hunting of bears or foxes in the ſnow, making the trees every where naked or laden with ſnow or a hoar froſt; the earth bare, without greenneſs, flowers, or cattle; the air thick or heavy; the water frozen, with carts paſſing over it, and boys playing upon it, *&c.* 11. Laſtly, let every ſite have its proper *parerga,* adjuncts or additional graces, as the farm-houſe, wind-mill, water-mill, woods, flocks of ſheep, herds of cattle, pilgrims, ruins of temples, caſtles, and monuments, with a thouſand ſuch other things only proper to particular ſubjects.

LANDSPERG, the name of two towns in Germany; one ſituated on the river Warta, thirty-two miles north eaſt of Frankfort upon the Oder; and the other, in Bavaria, twenty-three miles ſouth of Augſburg.

LANERK, a parliament-town of Scotland, ſituated on the river Clyde, twenty miles ſouth eaſt of Glaſgow.

LANGEAC, a town of France, forty miles ſouth of Clermont.

LANGLAND, an iſland of Denmark, ſituated in the ſtreight called the Great Belt, between Zeland and Funen.

LANGREL SHOT, at ſea, that conſiſting of two bars of iron, joined by a chain or ſhackle, and having half a ball of iron fixed on each end; by means of which apparatus, it does great execution among the enemy's rigging.

LANGRES, a great city of Champaign, the biſhop of which is one of the twelve peers of France: eaſt long. 5° 22′, and north lat. 48°.

LANGUAGE, a ſet of words which any people have agreed upon, whereby to communicate their thoughts to each other. Buffier obſerves, that the firſt principles of all languages may be reduced to expreſſions, ſignifying, firſt, the ſubject ſpoken of; ſecondly, the thing affirmed of it; and thirdly, the circumſtances of the one and the other: but as each language has its peculiar ways of denoting each of theſe, a language is only to be looked on as an aſſemblage of expreſſions, which chance or caprice has eſtabliſhed among a certain people. Hence we find, that it is uſage and cuſtom that are the rules of a language; and theſe hold their empire independent of reaſon, or any other cauſe: nor has reaſon any thing to do in language, unleſs to ſtudy or teach it ſuch as it is: here then commences grammar, a juſt plan of which ſuppoſes a language already introduced by uſe, and without pretending to alter or amend a tittle, only furniſhes reflections called rules, to which the manners of ſpeaking uſed in that language may be reduced: this aſſemblage of reflections is what we call the grammar of that language. See the articles GRAMMAR and WORD.

It is chance then to which we owe uſage, and uſage that makes the rules and meaſures of a language. Uſage indeed is ſomewhat dubious, and may be divided into good and bad: the difference between the two being this, that the former is better eſtabliſhed or authorized than the latter; and the difference of authority is no more, in the dead languages, than the writings of the beſt authors in that language; thoſe being allowed the beſt authors in the language, who wrote when the ſtate was in its greateſt glory. Thus the age of Auguſtus being the moſt diſtinguiſhed period in the roman hiſtory, we call that good latin which is conformable to the manners of ſpeaking uſed by authors who wrote within fifty years before, or after the reign of that emperor. As to the living languages, the good uſage, or mode, is that which obtains amongſt the moſt eminent perſons, whether as to quality and authority, or as to learning, and the reputation of writing well.

There is found a conſtant reſemblance between the genius of each people, and the language they ſpeak. Thus the Greeks, a polite but voluptuous people, had a language perfectly ſuitable, full of delicacy and ſweetneſs. The Romans, who ſeemed only born to command, had a language noble, nervous, and auguſt; and their deſcendants, the Italians, are ſunk into ſoftneſs and effeminacy, which is as eaſily perceivable in their language, as in their manners. The language of the Spaniards is full of that haughtineſs which conſtitutes the diſtinguiſhing character of the people. The French, who have a world of vivacity, have a language that runs extremely briſk and lively. And the Engliſh who are naturally blunt, thoughtful, and of few words,

words, have a language exceeding ſhort, concife, and ſententious. See the articles GREEK, LATIN, ITALIAN, FRENCH, and ENGLISH.

The diverſity of languages is generally allowed to have taken its riſe from the confuſion at the tower of Babel, both by Jews, Chriſtians, and Mahometans; but the manner in which this diverſity was effected, is ſtill in diſpute among the learned.

As to the point of antiquity and priority among languages, that too has been extremely controverted. The Egyptians and Phrygians diſputed concerning the antiquity of their languages: the Arabs diſpute the point of antiquity with the Jews; but theſe, jealous even to exceſs of the honour of their nation, poſitively inſiſt that the hebrew tongue, ſuch as is found in the holy ſcriptures, is the primitive language, and that ſpoken by the firſt man; while others contend that the hebrew, chaldee, and arabic are only dialects of the original tongue. However that be, the arabic is held to be the moſt copious of all languages. See the articles CHALDEE, HEBREW, &c.

Languages are in general divided into original or mother tongues, as the hebrew and arabic in the eaſt, the teutonic and ſclavonic in the weſt. See the articles SCLAVONIA and TEUTONIC.

Languages are alſo diſtinguiſhed into dead or learned languages, and living languages; the former are thoſe only which ſubſiſt in books, and which muſt be learned by the rules of grammar, as the greek, hebrew, ſyriac, and chaldee; and the latter are thoſe ſtill ſpoken in ſome country or other, and which may be learned by converſation; the moſt noted among theſe are the french, italian, ſpaniſh, and engliſh.

LANGUED, in heraldry, expreſſes ſuch animals whoſe tongue appearing out of the mouth, is borne of a different colour from that of the body.

LANGUEDOC, a province of France, bounded by Lionois, on the north; by the river Rhone, which divides it from Dauphine and Provence, on the eaſt; by the Mediterranean and the Pyrenees, on the ſouth; and by Guienne and Gaſcony, on the weſt.

LANGUOR, among phyſicians, ſignifies great weakneſs and loſs of ſtrength, attended with a dejection of mind; ſo that the patients can ſcarce walk, or even ſtand upright, but are apt to faint away.

LANIERS, or LANNIERS. See LANNIERS.

LANIGEROUS, an appellation given to whatever bears wool. See WOOL.

Lanigerous trees are ſuch as bear a woolly or downy ſubſtance, as in the catkins of the willows, &c.

LANIUS, the BUTCHER-BIRD, in ornithology, a ſpecies of falcon, with black legs, a grey back, and a variegated belly. See the article FALCON.

This is the ſmalleſt of all the birds of prey, uſed by falconers; being ſcarce equal to the black-bird in ſize.

LANNAR, or LANNERET, the blue-legged falcon, with oblong, black and white ſpots. It is a very beautiful bird, about the ſize of a common crow, very bold, and uſually kept for the diverſion of hawking. See the article HAWKING.

LANNIERS, or LANNIARDS, in a ſhip, are ſmall ropes reeved into the dead man's eyes of all ſhrowds, either to ſlacken them or to ſet them taught: the ſtays of all maſts are alſo ſet taught by lanniers.

LANTANA, in botany, a genus of the didynamia angioſpermia claſs of plants: the flower is monopetalous, with a plain and quinquifid limb: the fruit is a roundiſh unilocular drupe, which includes a bilocular nut, containing two oblong kernels.

LANTERLOO, or LOO, a game at cards, played ſeveral ways, whereof we ſhall only mention two.

The firſt way is this: lift for dealing, and the beſt put carries it: as many may play as the cards will permit; five being dealt to each, and then turning up trump. Now if three, four, five, or ſix play, they may lay out the threes, fours, fives, ſixes, and ſevens, to the intent they may not be quickly looed; or, if they would have the loos come faſt about, then they are to play with the whole pack.

Having dealt, ſet up five ſcores, or chalks. Then aſk every one, beginning with the eldeſt in hand, whether they will play, or paſs from the benefit of the game; and here it is to be obſerved, that the cards have the ſame values as in honours. You may play upon every card what ſum you pleaſe, from a penny to a pound; and if looed, that is, win never a trick, you muſt lay down to the ſtock ſo much for your five cards, as you played upon every one of them. Every deal rub off a ſcore, and for every trick you win ſet up a ſcore, till the firſt ſcores are out; then counting your ſcores, or the numbers of the tricks you have won, you are to

take

take from the ftock in proportion to the value. A flufh, or five cards of a fuit looes all the other hands, and fweeps the board; and if there be two flufhes, the eldeft in hand hath the advantage: the knave of clubs, called paam, has this privilege, that he makes a fuit with any other cards, and faves the perfon who has him from being looed.

The other way is this: the dealer lays down fo much for every card, as the company pleafe to play for; and the cards being dealt, all muft play; if any be looed, they muft each lay down fo much as the cards are valued at, for their loo; and if the perfon next dealing be looed, he muft lay down double the faid fum, *viz.* one for dealing, and the other for his loo. In cafe of a loo, the gamefters are afked, whether they will play, or not; beginning at the eldeft hand; but if there is no loo, they muft all play as at firft; and this neceffity, they juftly call *force*.

If there be never a loo, the money may be divided by the gamefters, according to the number of their tricks, or left till one be looed, as they fhall judge proper.

LANTERN, or LANTHORN, a device to carry a candle in; being a kind of cover ufually made of white iron, with fafhes of fome tranfparent matter, as glafs, horn, &c. to tranfmit the light.

Dark LANTERN, one with only a fingle opening, which may alfo be clofed up when the light is to be entirely hid; or opened, when there is occafion for the affiftance of the light to difcover fome object.

Feaft of LANTERNS, a chinefe feftival obferved on the fifteenth day of the firft month, when every chinefe fets out a large lantern, illuminated with a great number of wax-candles. Thefe lanterns are more or lefs fplendid, in proportion to the circumftances of the owner: fome of them are valued at ten thoufand crowns, on account of the decorations beftowed on them; thefe are from twenty to thirty feet diameter, and ferve as a kind of halls, in which they make fumptuous entertainments.

The chinefe afcribe the rife of this feftival to an unhappy accident which happened in the family of a certain mandarin, whofe daughter, as fhe was walking one evening on the bank of a river, fell in and was drowned, on which her father, it is faid, went in fearch of her with a great number of lanterns, and that the ceremony is annually kept up in remembrance of his daughter. Others afcribe it to an extravagant project of one of their emperors, who fhut himfelf up with his concubines in a magnificent palace, which he illuminated with a great number of fplendid lanterns; when the chinefe, fcandalized at his behaviour, demolifhed his palace and hung the lanterns all over the city.

Magic LANTERN, an optic machine, whereby little painted images are reprefented fo much magnified, as to be accounted the effect of magic by the ignorant.

The contrivance is briefly this: ABCD (plate CLII. fig. 4.) is a tin-lantern, from whofe fide there proceeds a fquare tube *bnklmc*, confifting of two parts; the outermoft of which *nklm* flides over the other, fo as that the whole tube may be lengthened or fhortened by that means. In the end of the arm *nklm*, is fixed a convex glafs *kl*: about *de*, there is a contrivance for admitting and placing an object, *de*, painted in dilute and tranfparent colours, on a plane thin glafs; which object is there to be placed inverted. This is ufually fome ludicrous or frightful reprefentation, the more to divert the fpectators: *bbc* is a deep convex glafs, placed in the other end of the prominent tube, the only ufe of which is to caft the light of the flame *a* ftrongly on the picture *de*, painted on the plane thin glafs. Hence, if the object *de* be placed farther from the glafs *kl* than its focus, it is manifeft that the diftinct image of the object will be projected by the glafs *kl*, on the oppofite white wall FH, at *fg*; and that in an erect pofture: fo that, in effect, this appearance of the magic lantern is the fame with that of the camera obfcura, or darkened room; fince here the chamber EFGH is fuppofed quite dark, excepting the light in the lantern ABCD. See CAMERA OBSCURA.

And here we may obferve, that if the tube *bnklmc* be contracted, and thereby the glafs *kl* brought nearer the object *de*, the reprefentation *fg* fhall be projected fo much the larger, and fo much the more diftant from the glafs *kl*; fo that the fmalleft picture at *de* may be projected at *fg*, in any greater proportion required, within due limits: whence it is, that this lantern got the name of *lanterna megalographica*. On the other hand, protracting the tube will diminifh the object.

Inftead of the convex glafs to heighten the light, fome prefer a concave fpeculum, its focus being nearer than that of

a

a lens; and in this focus, they place the candle.

Lantern, in architecture, a little dome raised over the roof of a building, to give light, and serve as a crowning to the fabric.

The term lantern is also used for a square cage of carpentry, placed over the ridge of a corridor, or gallery, between two rows of shops, to illumine them; like that of the Royal Exchange of London.

LANTERNISTS, a denomination assumed by the academicians of Tholouse.

LANUGO, the soft down of plants, like that growing on the fruit of the peach-tree; whence such plants are termed lanuginous.

LANZO, a town of Italy, in the territory of Piedmont, situated fifteen miles north of Turin.

LAODICEA, an antient city of the lesser Asia, situated east of Ephesus, now in ruins.

LAON, a city of France, in the province of the Isle of France, situated in east long. 3° 45′, lat. 49° 37′.

LAOS, a country of the farther India in Asia, bounded by China on the north; by Tonquin, on the east; by Siam and Cambodia, on the south; and by Ava and Pegu, on the west.

LAOTUNG, or Leaotung. See the article Leaotung.

LAPATHUM, the dock, in botany, is made by Linnæus, one genus with sorrel, and described under the name rumex. See the article Rumex.

The oxylapathum-root is chiefly used externally for the itch, and other cutaneous foulnesses, made into an ointment with lard. Internally, it makes an excellent ingredient in diet-drinks and decoctions, intended against the scurvy, and all other diseases of the skin: for besides its aperient and attenuant quality, it is possessed of an astringency that renders it very valuable, whereby, after dislodging the viscid humours, it restores the tone of the parts.

LAPIDARY, an artificer, who cuts precious stones. See the article Gem.

The art of cutting precious stones is of great antiquity. The French, tho' they fell into it but lately, have notwithstanding carried this art to a very great perfection, but not in any degree superior to the English.

There are various machines employed in the cutting of precious stones, according to their quality: the diamond, which is extremely hard, is cut on a wheel of soft steel, turned by a mill, with diamond-dust, tempered with olive-oil, which also serves to polish it.

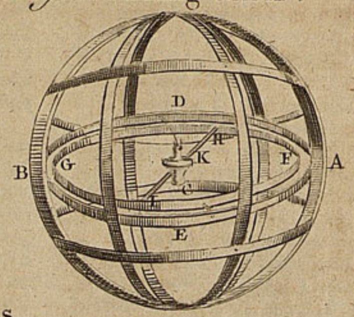
The description of the diamond-cutters wheel or mill, as represented in plate CLII. fig. 5. is as follows: *a* is the pincers; *b*, the screw of the pincers; *c*, the shell that carries the mastic and the diamond; *d*, the mastic that softens the diamond at the end of the shell; *e*, the diamond presented to the wheel, to be cut facetwise; *f*, the iron-wheel turning on its pivot; *g*, iron-pegs, to fix and keep the pincers steady; *h*, small pigs of lead of different weights, wherewith the pincers are loaded at pleasure to keep them steady; *i*, a wooden wheel; *k*, the axe of the wheel. It is bended and makes an elbow under the wheel, to receive the impulsion of a bar that does the office of a turning handle; *l*, the sole or square piece of steel, wherein the pivot of the tree or axis moves; *m*, the turning handle, that sets the wheel a-going by means of the elbow of its axis. The elbow of the piercer wherewith a hogshead is broached, will give an idea of this kind of motion; *n*, the catgut-string, that goes round both the iron and the wooden wheels. If the wooden wheel is twenty times larger than the iron-one, the latter shall make twenty turns upon the diamond, whilst the large wheel makes but one round its axis; and whilst the boy gives, without any resistance, a hundred impulsions to the turning handle, the diamond experiences a thousand times the friction of the whole grinding wheel.

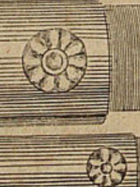
The diamond-cutter follows the work with his eyes, without taking any other share in it than that of changing the place of the diamond to bite on a new surface; and of timely throwing upon it, with a few drops of oil, the minute particles of the diamond's first ground one against the other, to begin the cutting of them.

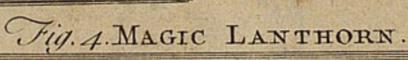
The oriental ruby, sapphire, and topaz, are cut on a copper-wheel with diamond-dust, tempered with olive-oil, and are polished on another copper wheel with tripoli and water. The hyacinth, emerald, amethyst, garnets, agates, and other stones, not of an equal degree of hardness with the other, are cut on a leaden wheel with smalt and water, and polished on a tin-wheel with tripoli. The turquois of the old and new rock, girasol and opal, are cut and polished on a wooden wheel with tripoli also.

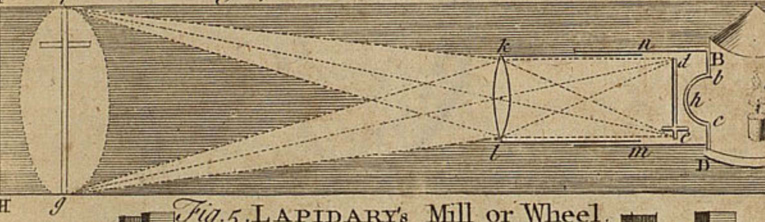
The lapidaries of Paris have been a corporation

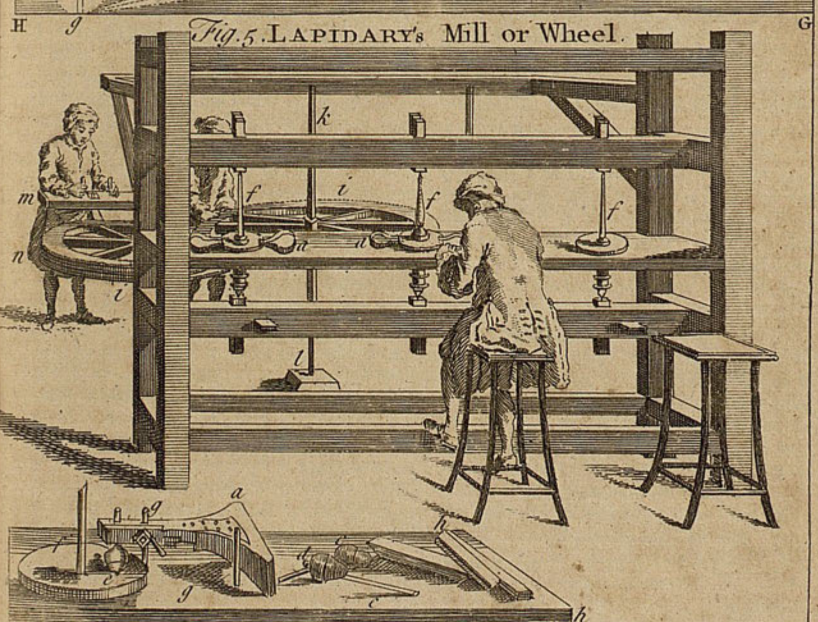












T. Jefferys sculp



poration since the year 1290. It is governed by four jurats, who superintend their rights and privileges, visit the master-workmen, take care of the master-piece of workmanship, bind apprentices, and administer the freedom.

LAPIDARY is also used for a virtuoso skilled in the nature, kinds, *&c.* of precious stones, or a merchant who deals in them.

LAPIDARY-STYLE denotes the style proper for monumental or other inscriptions; being a sort of medium between prose and verse. The jejune and brilliant are here equally to be avoided. Cicero has prescribed the rules of this style. "Accedat, "oportet oratio varia, vehemens, plena "spiritûs. Omnium sententiarum gravi- "tate, omnium verborum ponderibus, "est utendum."

The lapidary-style, which was lost with the antient monuments, has been retrieved at the beginning of this age by count Emanuel Tesoro. It is now used various ways, at the beginning of books; and even epistles dedicatory are composed in it, whereof we have no example among the antients. For an example of the manner of it among the greeks, see the article EPITAPH.

LAPIDESCENT, something that petrifies, or turns to stone. See the article STONE. The waters of many springs are impregnated with lapidescent particles of spar, wherewith bodies immersed in them being crusted over, are said to be petrified. See the article PETRIFACTION.

LAPIS, in general, is used to denote a stone of any kind. See STONE.

But besides this, its most common acceptation, the term lapis is applied by physicians, surgeons, and chymists, to several other substances, as well as different kinds of stone. 1. The lapis armenus, an ochre of copper, of a deep blue colour, is a violent emetic, the dose being from five to ten grains: it is one of the finest blues that nature furnishes for painting, and in oil makes a colour that will stand without alteration, almost as well as true ultra marine. The blue ochre of the shops, improperly called lapis armenus, is only a soft and friable earth. 2. Lapis bezoardicus fossilis, or fossile bezoar, is only the rough purple geodes, which contains in it a fine earth, said to be a very powerful sudorific, and a slight astringent. It is given in the small-pox and measles, and against the bites of venomous animals; the usual dose being from five grains to a scruple. 3. Lapis calaminaris. See CALAMINARIS. 4. Lapis divinus. See DIVINE STONE. 5. Lapis galactites. See GALACTITES. 6. Lapis hæmatites. See HÆMATITES. 7. Lapis hibernicus, irish slate, a slate strongly impregnated with alum, and often containing a portion of vitriol; of a soft and more friable texture than any of the other stones of that class; of a duskish colour, and remarkably heavy. It is given in powder as a styptic in all kinds of hæmorrhages, with success. 8. Lapis infernalis, the Lunar caustic, a preparation usually made from an evaporated solution of silver, but much better made from the crystals of silver in the following easy manner. See CRYSTAL. Put the crystals of silver into a clean glass-vessel, set it over burning charcoal, and let the crystals melt: when no more smoke arises from the melted matter, pour it out of the glass into little cylindric cavities, formed in clay, or into any thing else that will give it an oblong form. As soon as the matter is cold, take it out of the mould, wrap it in some warmed paper, and dry it thoroughly in it; then wipe the surface, and put it into a clean and dry bottle, and cork it well up. It will keep thus many years. It is a very powerful caustic, eating away the flesh, and even the bones it is applied to, only moistening the end of it first. 9. Lapis judaicus. See JEW'S STONE. 10. Lapis lazuli. See LAZULI. 11. Lapis melitites of the antients, an indurated clay, very heavy, of a pale white colour, with a faint cast of greyishness in it, variegated with spots, clouds, and veins of a pale yellow. It was antiently used in Egypt and Ethiopia: at present it is often met with in the german mines, and in the beds of several rivers both in France and Italy. The antients esteemed it as a vulnerary and narcotic. They ground it down into a thick liquor with water, and washed ulcers with it. They also gave it internally to people who were to suffer operations in surgery, in order to prevent their feeling the pain. At present it is little known in the world, and is used for no better purpose than that of marking in the manner of chalk. 12. Lapis morochthus of the antients, now called french chalk, is much the same kind with the former indurated clay, but more fine; being extremely dense, smooth, and glossy, when rubbed: the antients had it as well as the former from Egypt and Ethiopia,

Ethiopia, but the world is now fupplied with it from France, where it is in great abundance: the antients efteemed it an aftringent and lithontriptic: they alfo ufed a collyrium made of it in diforders of the eyes and eye-lids: however, at prefent we know nothing of it, but that it feems to take fpots out of clothes better than fullers-earth, and that it marks better than chalk. 13. Lapis nephriticus, nephritic ftone, a fpecies of jafper. See JASPER. It is found on the furface of the earth, and in the beds of rivers in many parts of America; it is pretended to have prodigious virtues as a diuretic, and to exert them in their full force on being worn externally. The Indians wear it alfo as a gem cut into various forms, and hung to their lips. 14. Lapis felenites, or moon-ftone; that fpecies of the felenites ufed in medicine is the common thin pellucid rhomboidal kind. See SELENITÆ. This is a beautiful foffil, perfectly pure from any extraneous mixtures, of a regular and determinate figure like that of the cryftals of blue vitriol: it is of various fizes, from one tenth of an inch in diameter, to fix or more inches. It is found in ftrata of clay, ufually of the blue tough kind. It is a powerful aftringent, and is of great effect in diarrhœas, dyfenteries, and hæmorrhages of all kinds. It is not much known in the fhops, tho' it ftands in moft books on the materia medica. 15. Lapis fpecularis, mufcovy-talc, or ifinglafs, a foffil well known for its many ufes, though the principal of thefe are not of the medicinal kind: it is one of the pureft and fimpleft of the natural bodies, and more than almoft any thing that we know refifts the force of menftruums, and even of fire. It is compofed of a multitude of extremely thin pellucid and beautiful plates, or flakes of great extent, each ufually making the whole furface of the mafs. It is found in great abundance in Mufcovy and Perfia, and in many mountains in Germany. There are fome who recommend it in powder for epilepfies. It is ufed in many of the arts and manufactures: the antients made their windows of it inftead of glafs: at prefent our minature-painters fometimes ufe it before their pictures inftead of glafs: it is alfo often ufed inftead of horn for lanterns; and the minute bodies intended for microfcopic obfervation are preferved between plates of it. 16. Lapis thyites of Diofcorides, is an elegant and beautiful fubftance of the nature of thofe bodies already mentioned, under the name of lapis melitites, and lapis morochthus; the antients ufed it in diftemperatures of the eyes, as they did the militites.

LAPIS AMPELITES. See AMPELITES.

LAPIS OBSIDIANUS, or the obfidian ftone, or chian marble, of the antients, the dull, fmooth, hard, black marble. See the article MARBLE.

LAPLAND, the moft northerly part of Europe, divided into Norwegian Lapland, Swedifh Lapland, and Ruffian Lapland: it lies between 10 and 35° of eaft long. and between 65 and 72° of north lat.

LAPSA, denotes a patron's neglect or omiffion to prefent to a church within fix months after it becomes vacant. When after a vacancy the patron does not prefent in fix months, the ordinary has the next fix months to collate to the benefice; and if he does not prefent within that time, the metropolitan has farther fix months to do it in; and if he fhould fail in doing it in his time, the next fix months devolves to the crown.

LAPSANA, STELLATED HAWK-WEED, in botany, a plant of the fyngenefia-polygamia æqualis clafs, the compound flower of which is imbricated with about fixteen equal and uniform hermaphrodite corollulæ; the partial corolla is monopetalous, ligulated, truncated, and quinquedentated; there is no pericarpium; the feed is fingle, oblong, and cylindrically trigonal; the receptacle is naked and plain.

This genus comprehends the lampfana, hedypnois, zacintha, and rhagadiolus or rhagadioloides of authors. In the lampfana the feeds are all naked, not furrounded by the fquamæ of the cup. In the rhagadiolus, every fquama of the cup inclofes a fingle feed. In the zacintha, the marginal feeds are each furrounded by a fquama of the cup, and the central ones are coronated with a fhort fimple down. In the hedypnois the marginal feeds are each furrounded in a fquama of the cup, and the central ones are coronated with a cup divided into five denticles.

LAPWING, *vanellus*, in ornithology. See the article VANELLUS.

LAQUEUS, in furgery, a kind of ligature fo contrived, that when ftretched by any weight, or the like, it draws up clofe. Its ufe is to extend broken or disjointed bones,

bones, to keep them in their places when they are ſet, and to bind the parts cloſe together. See EXTENSION, &c.

LAR, in geography, a city of Perſia, in the province of Fars, ſituated 360 miles ſouth eaſt of Iſpahan, in eaſt long 54° north lat. 28° 15′.

LAR-BOARD, among ſeamen, the left hand ſide of the ſhip, when you ſtand with your face towards the head.

LARCENY, in law, a felonious carrying away another perſon's goods; and this according to the value of the thing ſtolen, is either grand, or petit larceny; the firſt being ſtealing effects above the value of 1 s. and the laſt ſuch as are either of that value, or under it: but where two perſons together ſteal goods to the value of only 13 d. it is grand larceny in both: and if one perſon at different times ſteal ſeveral different things from the ſame perſon, which amount upon the whole to above 12 d. value, they may be joined in one indictment, and the offender found guilty of grand larceny; but this is very ſeldom practiſed; on the contrary, the jury, where the theft appears to be the firſt offence, frequently bring in their verdict, as they lawfully may, that the things are not above 10 d. value, and by that means reduce the offence to petit larcency, though the offender may perhaps be indicted for ſtealing to the value of 30 or 40 s. and upwards. The crime of grand larceny is puniſhable with death, and that of petit larceny, only with the corporal puniſhment of whipping, &c.

Larceny has been alſo divided into ſimple larceny by taking away the goods of another; mixed, or complicated larceny, which has a further degree of guilt, as in caſes of robbery, &c. private larceny, where the felonious taking from a perſon above the value of 12 d. is felony without benefit of clergy, if it be only laid in the indictment that it was done privately and ſecretly. And laſtly, open larceny, or ſuch as is committed with the party's knowledge, as where a thief ſnatches off a perſon's hat, and runs away with it; this is within the benefit of the clergy. A perſon may commit larceny, by taking away his own goods in the hands of another; as where the owner delivers goods to a carrier, or any other perſon, and aferwards ſecretly ſteals them, with an intent to charge him for them. If a perſon employs a child of ſix or ſeven years of age to take goods and bring them to him, and he carries them away, the child is not guilty of this crime on account of his infancy, but it is larceny in the other.

LAREDO, a port town of Spain, in the province of Biſcay, ſituated on the coaſt of Biſcay: weſt lon. 3°40′, north lat. 43°.30′.

LARES, certain inferior deities among the antient Romans, who were the guardians of houſes; they were alſo ſometimes taken for the guardians of ſtreets and ways, and Tibullus makes them the guardians of the fields. According to Ovid, they were the ſons of Mercury and Lara, whoſe tongue was cut out by Jupiter, becauſe ſhe revealed his adulteries to Juno; and not contented with this, he delivered her to Mercury, with orders to conduct her to hell; but he falling in love with her by the way, had twins by her, who from their mother were called lares.

Theſe domeſtic deities were ſometimes repreſented under the figure of a dog, the ſymbol of fidelity; becauſe dogs have the ſame function as the lares, which is to guard the houſe. At other times their images were covered with the ſkin of a dog, and had the figure of that domeſtic animal ſtanding by them. The principal ſacrifices to the lares, were incenſe, fruit, and a hog.

The Romans had a private place in their houſes, called lararium, in which, among other ſtatues of their gods, were their lares, and the images of their anceſtors. Tertullian tells us, that the cuſtom of worſhipping the lares aroſe from their antiently interring their dead in their houſes; whence the credulous people took occaſion to imagine, that their ſouls continued there likewiſe, and thence proceeded to pay them divine honours. To which may be added, that the cuſtom of burying them in the highways might occaſion their being conſidered likewiſe as gods of the highways.

LARGE, in the manege, a horſe is ſaid to go large and wide, when he takes in a great deal of ground, by going wide of the center of the volt, and deſcribing a great circumference.

LARGO, in the italian muſic, a ſlow movement, one degree quicker than the grave, and two than the adagio. See the articles ADAGIO and GRAVE.

LARINA, a town of Italy, in the kingdom of Naples, and province of Moliſe: eaſt long. 15° 45′, north lat. 41° 50′.

LARISSA, a city of european Turky in the province of Theſſaly, ſituated on the river Peneus: eaſt long. 23° 30′, north lat. 39°.

LARIX, the LARCH-TREE, a ſpecies of Pinus. See the article PINUS.

LARK, *alauda*, in ornithology. See the article ALAUDA.

To this genus belong, 1. The ſky-lark, with the long wing-feathers, variegated with white and brown. 2. The tit-lark, with a white line over the eyes. 3. The wood-lark, with the wings obliquely variegated with white. 4. The yellow-breaſted lark. 5. The ſnow-bird, or pied chaffinch, with the tail-feathers black, except the three lateral ones, which are white.

Sea-LARK, the engliſh name of a ſpecies of charadrius, with a black front and a white line on it. See CHARADRIUS.

LARK-SPUR, *delphinium*, in botany. See the article DELPHINIUM.

LARMIER, in architecture, a flat, ſquare, maſſive member of the corniche, between the cymatium and ovolo, and jetting out fartheſt; it is ſo called from its uſe, which is to diſperſe the water, and cauſe it to fall at a diſtance from the wall, drop by drop, or as it were by tears; *larme*, in french, ſignifying a tear. It is otherwiſe called corona. See CORNICHE.

LARTA, a port-town of european Turky, in the province of Epirus or Janna, ſituated at the entrance of the gulph of Venice: eaſt long. 21° 15′, north lat. 39°.

LARUS, the GULL, in ornithology, a genus of the anſeres-order of birds, thus characterized: the beak is ſtraight all the way, except juſt at the point, where it turns down; add to this, that it is obtuſe, not denticulated along the ſides, and its lower chap gibbous or protuberant underneath.

To this genus belong, 1. The white gull with a hoary back, about the ſize of a well-grown pullet. 2. The great grey gull, or white larus with a greyiſh-brown back, and ſomewhat larger than the firſt ſpecies. 3. The leſs gull, or ſea-mall with a grey back and ſpotted neck, about the ſize of a common tame pigeon. 4. The browniſh-grey ſea-mall, as large as the firſt ſpecies. 5. The torrock, or larus with a white head and a black ſpot on each ſide. 6. The peewit or black cap, ſo called from its black head; it is about the ſize of the third ſpecies. With ſeveral other ſpecies, diſtinguiſhed in the ſame manner.

LARYNGOTOMY, or BRONCHOTOMY. See the article BRONCHOTOMY.

LARYNX, the thick upper part of the aſpera arteria, or wind-pipe. The larynx is principally compoſed of five cartilages: the firſt is the thyroide or ſcutiform cartilage, which is of a kind of quadrangular figure, and ſtands in the anterior part; this is the largeſt of the five: the ſecond is the cricoide or annular one; this occupies the loweſt part, by way of baſe to the reſt; and to the loweſt part of this, what is properly called the aſpera arteria adheres: the third and fourth are the two arytænoide ones; theſe form, as it were, a kind of baſon of a ſingular figure, which is joined to the poſterior and ſuperior parts of the cricoides, by peculiar articulations on each ſide, that the glottis may be more eaſily opened and contracted: the fifth is the epiglottis. See GLOTTIS, EPIGLOTTIS, &c. The membrane which inveſts the larynx, is very ſenſible, and is furniſhed with a number of oſcula or openings, which diſcharge a lubricating fluid. There are alſo glands extended over each ſurface of it, which ſerve for ſecreting a mucous fluid, for lubricating the whole aſpera arteria. The ventricles of the larynx are certain hollows, ſome of them ſmaller and ſome larger; they are on the inſide of it, under the glottis, and ſerve to modulate the voice.

LASERPITIUM, LASER-WORT, a genus of the pentandria-digynia claſs of plants, the general corolla whereof is uniform; the partial one conſiſts of five nearly equal petals, inflexo-cordated at the ends; there is no pericarpium; the fruit is oblong and ſeparable into two parts, and is ridged with eight longitudinal membranes; the ſeeds are two, very large, oblong, and ſemi-cylindric, plane on the one ſide, but on the other ornamented on the back and edges with four membranes.

The root of laſſer-wort is ſaid to be good in the ſciatica, and for healing ſtrumæ and other excreſcences.

LASH, or LACE, in the ſea-language, ſignifies to bind and make faſt; as, to laſh the bonnet to the courſe, or the drabler to the bonnets: alſo the carpenter takes care that the ſpare yards be laſhed faſt to the ſhip's ſide; and in a rolling ſea, the gunners mind that the guns be well laſhed, leſt they ſhould break looſe. Laſhers are properly thoſe ropes which bind faſt the tackles and the breechings of the ordnance, when haled or made faſt within-board.

LASKETS, ſmall lines, like loops, ſewed to the bonnets and drablers of a ſhip, to

lash or lace the bonnets to the courses, or the drablers to the bonnets.

LASKING, at sea, is much the same with going large, or veering, that is going with a quarterly wind. See VEER.

LASSITUDE, or WEARINESS, κοπ☉-, in medicine, a morbid sensation, that comes on spontaneously, without any previous motion, exercise, or labour. This is a frequent symptom in acute distempers: it arises either from an increase of bulk, a diminution of proper evacuation, or too great a consumption of the fluids necessary to maintain the spring of the solids, or from a vitiated secretion of that juice.

The remedy in the first case is evacuations; and in the other a proper diet, or such alterative medicines as influence such a secretion. See the articles EVACUATION and SECRETION.

LAST, in general, signifies the burden or load of a ship.

It signifies also a certain measure of fish, corn, wool, leather, &c. A last of cod-fish, white herrings, meal, and ashes for soap, is twelve barrels; of corn or rape-seed, ten quarters; of gun-powder, twenty-four barrels; of red-herrings, twenty cades; of hides, twelve dozen; of leather, twenty dickers; of pitch and tar, fourteen barrels; of wool, twelve sacks; of stock-fish, one thousand; of flax or feathers, 1700 ℔.

LAST, in the marshes of Kent, is applied to a court held by the twenty-four jurats, in which orders are given for the imposing and levying of taxes, for preserving the said marshes.

LAST-HEIR, in law, he to whom lands come by escheat, for want of lawful heirs; who, in many cases, is the lord whereof they are held, but in others the king.

LASTAGE, or LESTAGE, as defined by Rastal, a duty exacted in some fairs and markets, for carrying things bought, whither one will; but, according to another author, it is the custom paid for wares sold by the last. It signifies also the ballast or lading of a ship; and sometimes is used for garbage, rubbish, or such like filth.

LATEN, or LATTEN. See LATTEN.

LATERAL EQUATION, in algebra, a simple equation, whose root is only in one dimension. See EQUATION.

LATERAN COUNCILS, those councils held in the basilica of the Latin church at Rome. See the article COUNCIL.

There have been five councils held in this place, *viz.* in the years 1123, 1139, 1179, 1215, and 1513.

Canons regular of the congregation of the LATERAN, were introduced in the time of pope Leo I. and continued in the church till the reign of Boniface, who displaced them, and put secular canons in their room; but one hundred and fifty years after, the regulars were reinstated again.

A LATERE, a term used to denote the qualifications of cardinals whom the pope sends as legates into foreign courts, who are called legates a latere, as being his holiness's assistants and counsellors in ordinary; these are the most considerable of the three other legates, being such as the pope commissions to take his place in councils, and so called in regard that he never gives this office to any but his favourites and confidants, who are always *a latere*, at his side. A legate a latere has the power of conferring benefices without a mandate, of legitimating bastards, to hold offices, and has a cross carried before him, as the ensign of his authority.

De LATERE, legates who are not cardinals, but yet are entrusted with an apostolical legation. See the article LEGATE.

LATH, in building, a long, thin and narrow slip of wood, nailed to the rafters of a roof or ceiling, in order to sustain the covering.

These are distinguished into three kinds, according to the different kinds of wood of which they are made, *viz.* heart of oak, sap-laths, and deal laths; of which the two last are used for ceilings and partitions, and the first for tiling only. Laths are also distinguished according to their length, into five-feet, four feet, and three-feet-laths, though the statute allows but of two lengths, those of five, and those of three feet, each of which ought to be an inch and a half in breadth, and half an inch in thickness, but they are commonly less.

Of cleaving LATHS. The lath-cleavers having cut their timbers into lengths, they cleave each piece with wedges, into eight, twelve, or sixteen, according to the size of their timber; these pieces are called bolts: this is done by the felt-grain, which is that grain which is seen to run round in rings at the end of a piece of a tree. Thus they are cut out for the breadth of the laths, and this work is called felting. Afterwards they cleave the laths into their proper thicknesses with their

their chit, by the quarter-grain, which is that which runs in ftraight lines towards the pith. See the article GRAIN.

LATH-BRICKS, bricks much longer than ordinary, ufed inftead of laths, for drying malt; for which purpofe they are extremely proper, as not being liable to catch fire, and retaining the heat much longer than thofe of wood; fo that a very fmall fire will ferve, after they are once heated. See BRICK and MALT.

LATHE, in turning, is an engine ufed in turning wood, ivory, and other materials. See plate CLIII. fig. 1. n° 1. It is compofed of two legs or ftyles, *a a*, which are commonly about two feet ten inches high, on the upper part of which are faftened two pieces of wood called cheeks, *b*, *b*, parallel to the horizon; between thefe are two pieces of wood, called puppets, *c*, *c*, made to flide between the cheeks, and to be fixed down at any point at pleafure; near the upper end of one of thefe puppets is faftened a ftrong fpike of tempered fteel, *d*, and oppofite to it, in the other, is an iron-fcrew *f*; by thefe the piece to be turned is fuftained, and is turned round by means of the ftring *m*, put round it, and faftened above to the pliable pole *l*, and underneath to the treddle or board, *i*, moved with the foot: there is alfo a piece of wood between the cheeks, called a reft, *e*, whofe office is to reft the tool upon, that it may lie in a fteady pofition while the workman ufes it.

When turners perform heavy work (which the pole and treddle will not command) they ufe inftead of thefe a wheel (*ibid.* n° 2.) which is turned about fometimes with one, and fometimes with two handles, according to the weight of the work; its ftring hath both its ends neatly faftened together, and this being fixed in a groove round the edge of the wheel, and after being croffed, put round a groove in the work, it is eafily turned round with a fwift and regular motion. This is the moft expeditious method of working; for the fpringing up of the pole makes an intermiffion in the turning of the work, but with the wheel it always turns the fame way, fo that the tool need never be taken off, unlefs it be to examine the work as it is doing.

Braziers, who turn pots, kettles, &c. have their lathe made in a different manner from that ufed by turners, as may be feen in plate CLIII. fig. 2.

The puppets and refts are much ftronger than thofe ufed by the turners; their edge-tools, which they call hooks, are alfo of a different fhape from the chiffels and other tools ufed by turners, as may be feen *ibid.* marked B 1, B 2, B 3, being bent backwards and forwards at the cutting end. And as the common turners work with a round ftring made of gut, the braziers work with a flat leather-thong, which wrapping clofe and tight about the rowler of their mandril, commands it with the greater eafe, and turns it more forcibly about.

Small work in metal is turned in an iron-lathe, called a turn-bench, reprefented in plate CLIII. fig. 3. When this is ufed, it is fixed in the chaps of a vice, and the work being fitted on a fmall iron-axis, with a drill-barrel fitted upon a fquare fhank near the end of it, the workman turns it round with a drill bow, which he holds in his left hand, while he forms the moulding with a graver or other tool, which he holds in his right.

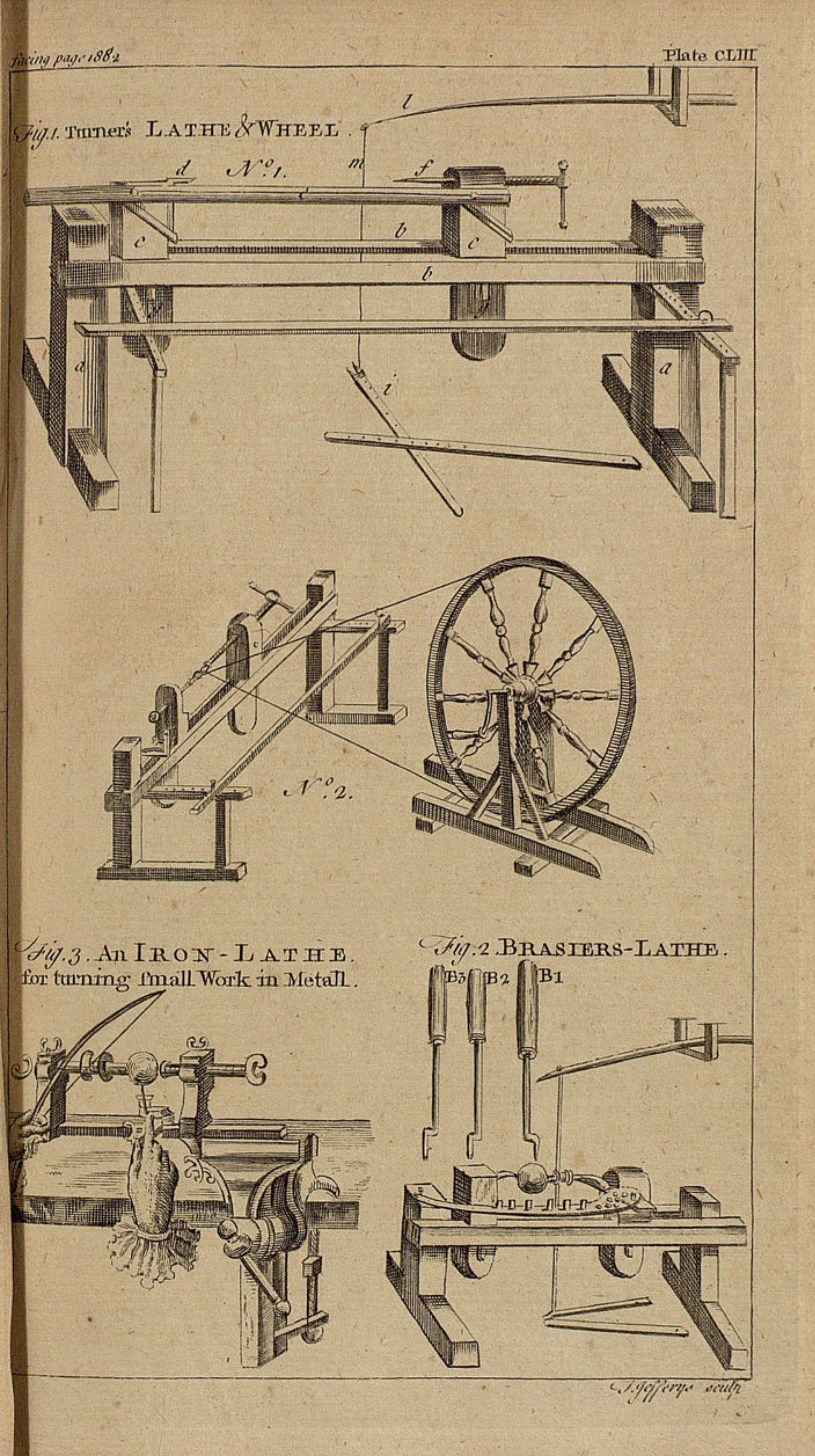
In turning oval or rofe-work, the common turner's lathe muft be provided with the additional parts reprefented in plate CLIV. fig. 1. which reprefents the whole machine with all its parts ready for working, A being the fore-puppet, with its apparatus; B, the hinder puppet; C, a hollow axis, turned into a fcrew-fafhion, to direct the weight D, by means of the nut E; and F, the fupport of the tools, which may be raifed or lowered at pleafure.

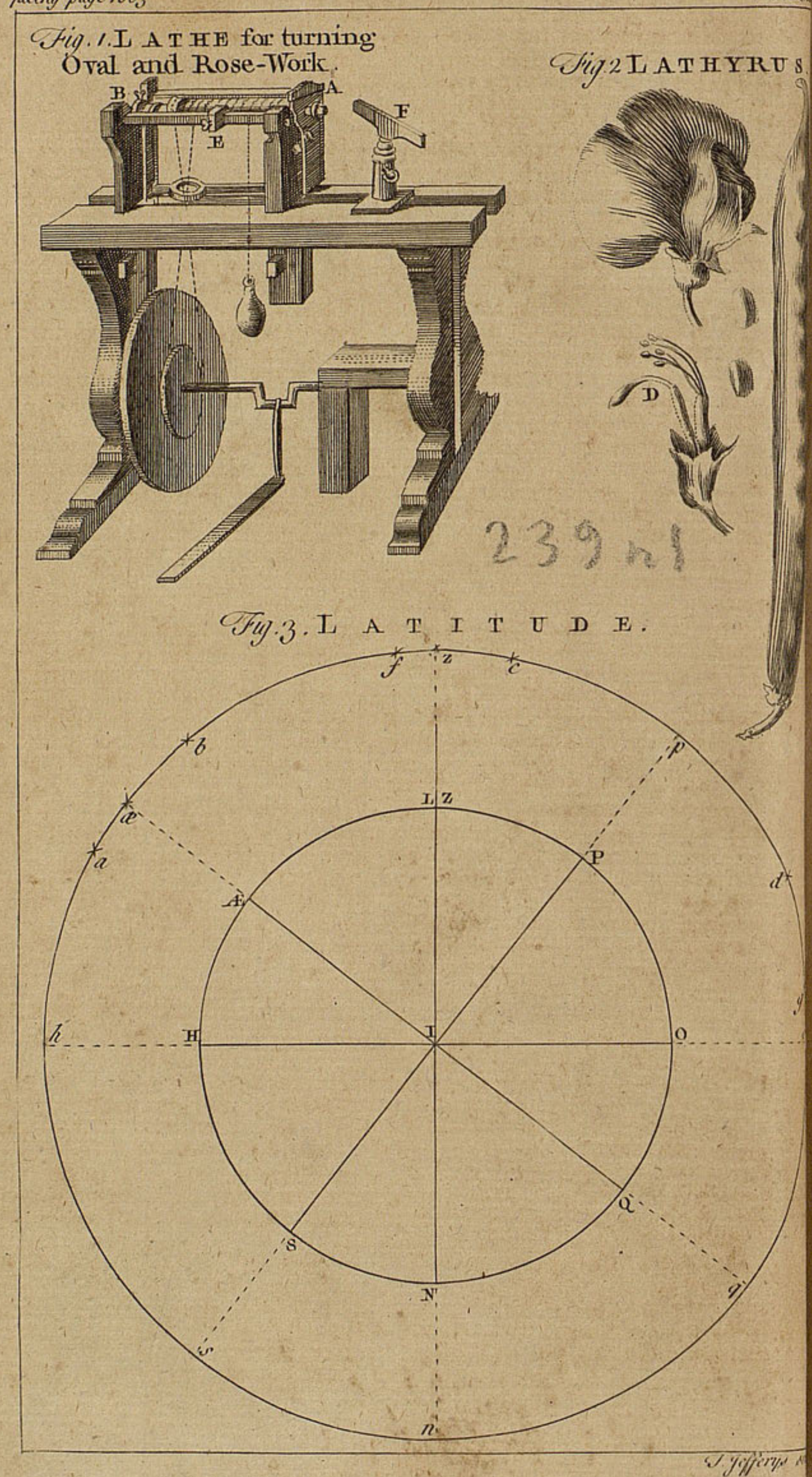
LATHE, or LETH, as ufed in Kent and Suffex, is part of a county, containing three or four hundreds.

LATHRÆA, GREAT TOOTH-WORT, in botany, a genus of the didynamia-angiofpermia clafs of plants, the corolla whereof confifts of a fingle petal; the tube is longer than the cup; the limb is ringent and ventricofe; the upper-lip is concave, galeated, and broad, with a narrow crooked apex; the inferior one is lefs, and is reflex, obtufe, and trifid; the fruit is a roundifh elaftic capfule, confifting of two valves, and containing only one cell; it is covered with a very large patent cup; the feeds are few and roundifh.

LATHYRUS, CHICKLING PEA, in botany, a genus of the diadelphia-decandria clafs of plants, the corolla of which is papilionaceous; the fruit is a very long, cylindric or compreffed, acuminated pod, confifting of two valves; the feeds are numerous, of a cylindric, globofe, or fomewhat angular figure. See plate CLIV. fig. 2. and the article APHACA.

LATIAR FESTIVAL, in roman antiquity,


Fig. 1. Turner's LATHE & WHEEL.
No. 1.
l
m
d
f
b
c
c
b
d
a
i
No. 2.
Fig. 3. An IRON-LATHE. for turning small Work in Metall.
Fig. 2 BRASIERS-LATHE.
B3
B2
B1
T. Jefferys sculp.


Fig. 1. LATHE for turning Oval and Rose-Work.
B
A
F
E
Fig. 2 LATHYRUS
D
239 n1
Fig. 3. LATITUDE.
f
z
c
b
p
LZ
æ
a
P
d
Æ
h
H
I
O
Q
S
N
q
s
n

T. Jefferys

ty, the same with the latin feriæ. See the article FERIÆ LATINÆ.

LATICLAVIUM, or LATUS CLAVUS, in the roman antiquity. See the article CLAVUS.

LATIN, a dead language, first spoken in Latium, and afterwards at Rome; and still used in the romish church, and among many of the learned.

This language is principally derived from the greek, and particularly from the eolic dialect of that tongue, though it has a great number of words which it borrowed from the languague of the Etrusci, Osci, and other antient people of Italy; and foreign commerce and wars, in course of time, added a great many more.

The latin is a strong nervous language, perfectly suitable to the character of the people who spoke it; we have still works of every kind, admirably well written in the latin, though there are vast numbers lost. The latin is more figurative than the english, more harmonious than the french, less copious than the greek, less pompous than the spanish, less delicate than the italian, but closer and more nervous than any of them.

The latin tongue was for a while confined almost wholly within the walls of Rome; nor would the Romans allow the common use of it to their neighbours, or to the nations they subdued: but, by degrees they in time became sensible of the necessity of its being generally understood for the conveniency of commerce; and accordingly used their endeavours that all the nations subject to their empire, should be united by one common language, so that at length they imposed the use of it, by a particular law for that purpose. After the translation of the seat of the empire from Rome to Constantinople, the emperors of the east being always desirous of retaining the title of roman emperors, appointed the latin to be still used; but at length neglecting the empire of the west, they abandoned all care of the latin tongue, and used the greek. Charlemagne coming to the empire of the west, revived this language; but at length it gave way, and the french took place of the latin: it was, however, prodigiously degenerated before it came to be laid aside, in which condition it was found at the time of the reformation, when Vives, Erasmus, *&c.* began to open the way for its recovery: since which time the monkish latinity has been declining, and all endeavours have been used to retrieve the pure language of the augustan age. See the article LANGUAGE.

LATIN CHURCH. See CHURCH.

LATIN BIBLE. See the article BIBLE.

LATISSMUS, in anatomy, a large muscle of the back, so called from its great breadth. See the article DORSUM.

LATITAT, a writ which issues out of the king's bench, so denominated from a supposition that the defendant lies lurking and concealed, after having fled out of Middlesex, into some other county; to the sheriff whereof this writ is directed, commanding him to apprehend the defendant there.

LATITUDE, *latitudo*, in geography, is the distance of any place from the equator, measured in degrees, minutes, and seconds, upon the meridian of that place; and is either north or south, according as the place is situated either on the north or south side of the equator: thus, let L (plate CLIV. fig. 3.) represent London, P the north pole, Æ Q the equator; then will P L Æ Q be the meridian of London, and the arch Æ L the latitude of London; which being equal to 51° 32′, it is said to be 51° 32′ north. See EQUATOR.

The latitude of a place is always equal to the elevation of the pole above the horizon: thus, L Æ, the latitude of London, is equal to the arch P O, the elevation of the pole P, above the horizon H O.

The complement of latitude is always equal to the elevation of the equator above the horizon, or the angle intercepted between the plane of the equator and the plane of the horizon: thus, the complement of the arch Æ L, the latitude of London, is Æ H, which measures the elevation of the equator Æ Q, above the horizon H O, or the angle Æ I H intercepted between the planes of the equator and horizon, being 38° 28′, which added to 51° 32′, is equal to 90°. See the article COMPLEMENT.

The latitude of a place, or of a ship at sea, is found by taking the meridian altitude of the sun, or of a star whose declination is known. This problem admits of several cases, which are these: 1. When the sun or star has no declination, or is upon the equator, at *æ* (plate CLIV. fig. 3.) then the zenith-distance of the object *æ z*, is equal to the latitude of the place, which is north latitude, if the sun or star come to the meridian of the south side of the zenith; and south latitude, if on the north side. 2. If the sun or star, when on the meridian, is in the zenith

at z; then the declination of the object $æz$, is equal to the latitude of the place; conſequently, if the declination be north, the latitude will alſo be north; and if ſouth, ſouth. 3. If the ſun or ſtar be between the equator and zenith, as at b; then the latitude of the place is equal to the ſum of the zenith-diſtance and declination of the object; that is, latitude $= zb + bæ$: and it is of the ſame name with the declination, *viz.* north or ſouth, according as the declination is north or ſouth. 4. If the ſun or ſtar be on the contrary ſide the equator, as at a, and conſequently the declination and zenith-diſtance of the ſame name, *viz.* either both north or both ſouth; then the latitude is found by ſubtracting the declination from the zenith-diſtance; that is, latitude $= az - aæ$: and it is of a contrary name with the declination. 5. If the ſun or ſtar be between the zenith and the neareſt pole, as at c, and conſequently both declination and zenith-diſtance be of the ſame name; then from the declination ſubtract the zenith-diſtance, and the remainder will be the latitude; that is, latitude $= cæ - cz$. 6. If the ſun or ſtar be between the horizon and the elevated pole, as at d; then to the altitude add the complement of the declination, and the ſum $do + dp$ will be the latitude. 7. When the obſerved object does not ſet, as at c and d, and conſequently the complement of its declination leſs than the latitude of the place; then the latitude may be found by obſerving both the meridian altitudes, *viz.* the greateſt at c or f, and the leaſt at d or g, without knowing the declination of the object; for if both the altitudes be on the ſame ſide of the zenith, as at c and d, then from the greateſt ſubtract the leaſt, and half the remainder added to the leaſt, gives the latitude; that is, $co - do = cd$, and $\frac{cd}{2} (= pd) + do =$ latitude. But if the greateſt and leaſt meridian-altitudes of the object be upon different ſides of the zenith, as at f and g, then from the ſupplement of the greateſt altitude ſubtract the leaſt, and half the remainder added to the leaſt altitude, will give the latitude; that is, $fo - go = fg$, and $\frac{fg}{2} (= pg) + go =$ latitude.

The latitudes of the ſeveral cities, towns, and other places of note on the globe, may be ſeen ranged each under its proper head, throughout the courſe of this work.

LATITUDE, in aſtronomy, the diſtance of a ſtar or planet from the ecliptic, in degrees, minutes, and ſeconds, meaſured on a circle of latitude drawn through that ſtar or planet, being either north or ſouth, as the object is ſituated either on the north or ſouth ſide of the ecliptic. See the articles ECLIPTIC and CIRCLE *of latitude.*

The ecliptic being drawn on the common celeſtial globes, we may ſee what conſtellations it paſſes through: there are uſually ſix circles of latitude, which by their mutual interſections, ſhew the poles of the ecliptic, as well as divide it into twelve equal parts, anſwerable to the number of months in a year. Fig. 1. of plate CLV. repreſents a celeſtial globe, where A G is the ecliptic, N the north, S the ſouth pole of the ecliptic, N A S, N B S, N C S, N D S, *&c.* are circles of latitude. The ſtar H, is in ſo many degrees, minutes, and ſeconds of north latitude, as the arch H A amounts to; and the ſtar I, is in ſouth latitude, the quantity whereof is meaſured by the arch I B. From what has been ſaid, it appears that we muſt carefully diſtinguiſh the different notions of latitude, when applied to ſtars in the heavens, and to places on the earth; that is, between latitude in aſtronomy, and latitude in geography; for in the heavens, or on the celeſtial globe, it is the diſtance from the ecliptic; but on the earth, or upon the terreſtrial globe, it is the diſtance from the equator. Indeed, ſometimes we conſider the diſtance of the heavenly bodies from the celeſtial equator; but this is called declination, for finding which, ſee the article DECLINATION.

The latitude of a planet is either heliocentric, or geocentric. See the articles HELIOCENTRIC and GEOCENTRIC.

North aſcending LATITUDE, *of the moon*, is when ſhe proceeds from the aſcending node towards her northern limit, or greateſt elongation. See the articles MOON, ELONGATION, and NODE.

North deſcending latitude, is when the moon returns from her northern limit to the deſcending node. South deſcending latitude, is when ſhe proceeds from the deſcending node to her ſouthern limit. South aſcending latitude, is when ſhe returns from her ſouthern limit to her aſcending node.

The ſame thing holds good of the other planets. See the articles ASCENDING and DESCENSION.

LATITUDINARIAN, a perſon of moderation,

deration, with regard to religious opinions who believes there is a latitude in the road to heaven, which may admit people of different persuasions.

In this sense all protestants are latitudinarians, since they allow that many among the papists may be saved; though the bigotry of these last will not permit them to allow the same with respect to protestants.

LATRIA, λατρεια, among papists, signifies the worship due to God only; in contradistinction to dulia, which is that paid to saints. See the articles ADORATION, WORSHIP, SAINT, &c.

LATTEN, denotes iron-plates tinned over, of which tea-canisters are made.

Plates of iron being prepared of a proper thinness, are smoothed by rusting them in an acid liquor, as common water made eager with rye: with this liquor they fill certain troughs, and then put in the plates, which they turn once or twice a day, that they may be equally rusted over; after this they are taken out, and well scowered with sand, and, to prevent their rusting again, are immediately plunged into pure water, in which they are to be left till the instant they are to be tinned or blanched, the manner of doing which is this: they flux the tin in a large iron-crucible, which has the figure of an oblong pyramid with four faces, of which two opposite ones are less than the two others. The crucible is heated only from below, its upper part being luted with the furnace all round. The crucible is always deeper than the plates, which are to be tinned, are long; they always put them in downright, and the tin ought to swim over them; to this purpose artificers of different trades prepare plates of different shapes, tho' Mr. Reaumur thinks them all exceptionable. But the Germans use no sort of preparation of the iron, to make it receive the tin, more than the keeping it always steeped in water, till the time; only when the tin is melted in the crucible, they cover it with a layer of a sort of suet, which is usually two inches thick, and the plate must pass through this before it can come to the melted tin. The first use of this covering is to keep the tin from burning; for if any part should take fire, the suet would soon moisten it, and reduce it to its primitive state again. The blanchers say, this suet is a compounded matter; it is indeed of a black colour, but Mr. Reaumur supposed that to be only an artifice to make it a secret, and that it is only coloured with soot or the smoke of a chimney; but he found it true so far, that the common unprepared suet was not sufficient; for after several attempts, there was always something wanting to render the success of the operation certain. The whole secret of blanching, therefore, was found to lie in the preparation of this suet; and this, at length, he discovered to consist only in the first frying and burning it. This simple operation not only gives it the colour, but puts it into a condition to give the iron a disposition to be tinned, which it does surprisingly.

The melted tin must also have a certain degree of heat, for if it is not hot enough, it will not stick to the iron; and if it is too hot, it will cover it with too thin a coat, and the plates will have several colours, as red, blue and purple, and upon the whole will have a cast of yellow. To prevent this, by knowing when the fire has a proper degree of heat, they might try with small pieces of iron; but in general, use teaches them to know the degree, and they put in the iron when the tin is at a different standard of heat, according as they would give it a thicker or thinner coat. Sometimes also they give the plates a double layer, as they would have them very thickly covered. This they do by dipping them into the tin when very hot the first time, and when less hot the second. The tin which is to give the second coat, must be fresh covered with suet, and that with the common suet, not the prepared.

LATTEN-BRASS, plates of milled brass, reduced to different thickness, according to the uses it is intended for.

LATUS RECTUM, in conic sections, the same with parameter. See PARAMETER.

LATUS TRANSVERSUM, in the hyperbola, that part of the transverse diameter, intercepted between the vertices of the two opposite sections. See the article HYPERBOLA.

LATUS PRIMARIUM, a right line belonging to a conic section, drawn through the vertex of the section, and within it. See the article CONIC SECTIONS.

LAVAMUND, a city of Germany, in the circle of Austria, and dutchy of Carinthia, situated at the confluence of the rivers Drave and Lavamund: east long. 15°, and north lat. 47°.

LAVANDULA, LAVENDER, in botany, a genus of the didynamia-gymnospermia class of plants, the corolla whereof consists

fifts of a fingle ringent petal; the tube is cylindric, and longer than the cup; the limb is patent; the fuperior lip is greater, bifid, and patent; the inferior one trifid, with all the lacinia roundifh, and almoft equal; there is no pericarpium; the cup is connivent at the mouth, and contains four roundifh feeds.

Lavender is a cephalic, nervous, and uterine medicine: it is alfo good in vertigoes, lethargies, fpafms, and even in palfies, and apoplexies. It difpels flatulencies alfo, and is good in fuppreffions of urine and the menfes. There is a water diftilled from it well known for its fragrancy and cephalic virtue.

LAVATERA, in botany, a genus of the monadelphia-polyandria clafs of plants; the corolla whereof confifts of five plane, patent, vertically cordated petals, growing together at the bafe; the fruit confifts of a number of capfules; the receptacle is columnar, and affixed to the capfules; the feed is fingle and kidney-fhaped.

LAVATORY, or LAVOREDO, an appellation given to certain places in Chili and Peru, where gold is feparated from earth by wafhing. See the articles GOLD and WASHING *of ores*.

LAUBACH, a city of Germany, in the circle of Auftria, and the capital of the dutchy of Carinthia: eaft long. 14° 40′, and north lat. 46° 28′.

LAUDA, a town of Germany, in the circle of Franconia and bifhopric of Wurtfburg: eaft long. 9° 30′, and north lat. 49° 35′.

LAUDANUM, a preparation of opium. See the article OPIUM.

LAUDER, a borough-town of Scotland, in the fhire of Mers, fituated twenty-two miles fouth-eaft of Edinburgh.

LAVENDER, the fame with lavandula. See the article LAVANDULA.

LAVER, a facred utenfil in the temple of Jerufalem, confifting of a bafon, whence they drew water by cocks.

LAUFFEN, a town of Germany, in the circle of Swabia and dutchy of Wirtemburg: fituated on the river Neckar: eaft long. 9° 5′, north lat. 49°.

LAUFFENBURG, a town of Germany, in the circle of Swabia, fituated on the Rhine: eaft long. 8°, north lat. 47° 36′.

LAUGHTER, a paffion peculiar to mankind, occafioned by fomething that tickles the fancy. See the articles PASSIONS.

In laughter, the eye-brows are raifed about the middle, and drawn down next the nofe; the eyes are almoft fhut; the mouth opens, and fhews the teeth; the corners of the mouth being drawn back, and raifed up; the cheeks feem puffed up, and almoft hide the eyes; the face is ufually red, and noftrils open, and the eyes wet.

LAUNCESTON, the county-town of Cornwal, thirty-fix miles weft of Exeter: weft long. 4° 40′, north lat. 50° 45′. It fends two members to parliament.

LAUNCH, in the fea-language, fignifies to put out: as, *launch the fhip*, that is, put her out of the dock: *launch aft*, or *foreward*, fpeaking of things that are ftowed in the hold, is, put them more foreward: *launch, ho!* is a term ufed when a yard is hoifted high enough, and fignifies hoift no more.

LAUNDER, among miners, a place where they wafh the powdered ore. See the article WASHING *of ores*.

LAURA, in church-hiftory, a name given to a collection of little cells, at fome diftance from each other, in which the hermits, in antient times, lived together in a wildernefs.

Thefe hermits did not live in community, but each monk provided for himfelf in his diftinct cell. The moft celebrated lauras mentioned in ecclefiaftical hiftory, were in Paleftine; as the laura of St. Euthymius, at four or five leagues diftance from Jerufalem; the laura of St. Saba, near the brook Cedron; the laura of the Towers, near the river Jordan, &c.

LAUREATION, in the univerfities of Scotland, fignifies the act of taking the degree of mafter of arts, which the ftudents are permitted to do after four years ftudy.

LAURENCE, or *Canons regular of St.* LAURENCE, a religious congregation in France, faid to have been founded by St. Benedict.

LAURENTALIA, in roman antiquity, a feftival celebrated in honour of Acca Laurentia, Romulus's nurfe.

LAURUS, in botany, a genus of the enneandria-monogynia clafs of plants, the corolla whereof confifts of fix ovato-acuminated, concave, and erect petals, the nectarium is compofed of three coloured, acuminated tubercles, terminating in two hairs, and ftanding round the germen; the fruit is a drupe of an oval, acuminated figure, containing only one cell, and contained in the corolla; the feed is a fingle, ovato-acuminated nut, and its kernel is of the fame figure.

This genus comprehends the laurus, or bay-

bay-tree, the cinnamon-tree, the camphire-tree, the benjamin-tree, and the saffafras-tree. See the article CINNAMON, CAMPHOR, BENJAMIN, and SASSAFRAS.

The leaves and berries of the bay-tree, or common laurus, are only ufed in medicine, and are warm carminatives, and fometimes exhibited in this intention againft flatulent colics, ; and likewife in hyfterical diforders. Their principal ufe, in the prefent practice, is in glyfters, and fome external applications. The leaves enter our common fomentation, and the berries the plafter and cataplafm of cumin ; they alfo give name to an electuary, which is little otherwife ufed than in glyfters.

LAUSANNE, a city of Switzerland, in the canton of Bern, fituated on the north fide of the lake of Geneva : eaft long. 6° 31′, and north lat. 46° 33′.

LAUTERBURG, a town of Germany, in the circle of the Upper Rhine, and landgravate of Alface : eaft long. 8°, and north lat. 48° 45′.

LAUTERBURG is alfo a town of Poland, in the province of Royal Pruffia : eaft long. 20°, and north lat. 53° 30′.

LAW, in general, is defined to be a certain rule for the good government of mankind in fociety. See GOVERNMENT.

This rule or law is nothing but a decree, by which the fuperior obliges thofe fubject to him, to accommodate their actions to the directions prefcribed therein. But that a law may exert its force in the minds of thofe to whom it is promulgated, it is requifite that the law-giver and the law be likewife known. The legiflator of the laws of nature, can be no other than the Creator of the univerfe. No man in civil fociety can be ignorant who it is that has power over him ; and of the laws he has notice given him, by a publication plainly and properly made, in which thefe two things ought to be afcertained, that the author of the law is he who hath the fupreme authority in the community, and that this or that is the true meaning of the law. The firft is known, if it be promulged with his own mouth, under his own hand, or if it be done by proper delegates regularly admitted to that office : they muft be thus judicioufly executed, and, befides that, contain nothing derogatory to the fovereign power. As to the true fenfe, after the greateft plainnefs ufed by the promulgers, an explication is to be fought of the legiflator, or thofe who are publicly appointed to give judgment according to law. See the article JUDGE.

Every perfect law has two parts ; the one directing what is to be done, or omitted ; the other declaring the punifhment incurred, by neglecting to do what is commanded, or attempting what is prohibited. And herein all the force of law confifts. See the article PUNISHMENT.

Law may be divided, with refpect to its authors, into divine and human : the former may be confidered as twofold, to wit, natural or moral, and pofitive. Natural law is that which God has made known to mankind by the light of natural reafon. Pofitive law is that which he has revealed by his prophets : fuch were the laws delivered to the Jews relating to the divine worfhip and polity peculiar to that people.

Civil or human laws, confidered with refpect to the legiflator's two offices, of judging and compelling, may be divided into diftributive and penal. Diftributive law, is that which gives every fubject what properly belongs to him, forbidding others to injure him either in his privileges or property : and penal law is that which determines, or appoints, what punifhments fhall be inflicted on thofe who violate the diftributive laws ; it is mandatory, and fpeaks only to the public officers, or magiftrates.

The laws of any kingdom, or ftate, firft began with the ftate itfelf : and if we confider the world as one univerfal fociety, or Europe as one great commonwealth, the law by which feparate nations is governed, with refpect to treaties, alliances, the fending embaffadors, &c. is called jus gentium, or the law of nations : but when it is confidered as made up of particular ftates the law which regulates the public order of each, is called jus publicum ; and that law which determines the private rights of men, is called jus civili, or civil law. See CIVIL LAW.

The laws of England are at prefent divided into the common law, which is the moft antient law of the kingdom ; the ftatute-law, made by the king and both houfes of parliament ; and particular cuftoms in feveral parts of the kingdom : but our laws are more largely divided into the crown law ; the law and cuftom of parliament ; the common law ; the ftatute-law ; reafonable cuftoms ; the law of arms ; ecclefiaftical or canon-law ; the civil law ; the foreft-law ; the law of

marque and reprifals ; the law of merchants ; martial law, &c. See the articles COMMON LAW, STATUTE, PARLIAMENT, FOREST, &c.

Our laws have great refpect to life, liberty, freehold, and inheritance : their ufe is to fecure the continuance of thofe bleffings we enjoy ; and they have therefore a particular relation to perfons and their eftates, to crimes and mifdemeanors, &c. See ESTATE, CRIME, &c.

LAWS *of nature*, or *Motion*, in phyfics, are axioms, or general rules of motion and reft, obferved by all natural bodies in their actions upon one another. Of thefe Sir Ifaac Newton has eftablifhed three, which may be feen under the article MOTION.

Salic LAW. See the article SALIC.

LAW *of arms*, is a law which gives precepts how to proclaim a war, to attack the enemy, and to punifh offenders in the camp.

LAWENBURG, a city of Germany, in the dutchy of the fame name, fituated on the river Elbe, fifteen miles north-eaft of Lunenburg : eaft long. 10° 37′, and north lat. 53° 45′.

LAWING *of Dogs*, the fame with expeditating. See the article EXPEDITATE.

LAWINGEN, a town of Germany, in the circle of Swabia, fituated on the Danube : eaft long. 10° 20′, and north lat. 48° 38′.

LAWLESS COURT, a court faid to be held annually on King's hill, at Rochford, in Effex, on the Wednefday morning after Michaelmas-day, at cock-crowing, where they whifper, and have no candle nor any pen and ink, but only a coal. Perfons who owe fuit, or fervice, and do not appear, forfeit double their rent every hour they are miffing.

This fervile attendance, Camden informs us, was impofed on the tenants for confpiring at the like unfeafonable time to raife a commotion. The court belongs to the honour of Raleigh, and to the earl of Warwick, and is called lawlefs from its being held at an unlawful hour.

LAWN, a fpacious plain in a park, or adjoining to a noble feat. As to the dimenfions of a lawn, in a large park, it fhould be as extenfive as the ground will permit ; and, if poffible, it fhould never be lefs than fifty acres : but in gardens of a moderate extent, a lawn of ten acres is fufficient ; and in thofe of the largeft fize, fifteen acres. The beft fituation for a lawn, is in the front of the houfe ; and here, if the houfe front the eaft, it will be extremely convenient ; but the moft defirable afpect for a lawn, is that of the fouth-eaft. As to the figure of the lawn, fome recommend an exact fquare, others an oblong fquare, fome an oval, and others a circular figure : but neither of thefe are to be regarded. It ought to be fo contrived, as to fuit the ground ; and as there fhould be trees planted for fhade on the boundaries of the lawn, fo the fides may be broke by irregular plantations of trees, which, if there are not fome good profpects beyond the lawn, fhould bound it on every fide, and be brought round pretty near to each end of the houfe. If in thefe plantations round the lawn, the trees are placed irregularly, fome breaking much forwarder on the lawn than others, and not crowded too clofe together, they will make a better appearance than any regular plantations can poffibly do ; and if there are variety of trees properly difpofed, they will have a good effect : but only thofe which make a fine appearance, and grow large, ftraight and handfome fhould be admitted here. The moft proper trees for this purpofe, are the elm, oak, chefnut and beech ; and if there are fome clumps of ever-green trees intermixed with the others, they will add to the beauty of the whole, efpecially in the winter-feafon; the beft forts for this purpofe, are lord Weymouth's pine, and the filver and fpruce firs.

LAWSONIA, in botany, a genus of the octandria-monogynia clafs of plants ; the corolla whereof confifts of four, plane, ovato-lanceolated, patent petals ; the fruit is a globofe capfule, terminating in a point, and containing four cells ; the feeds are numerous, angular and acuminated.

LAWYER fignifies a counfellor, or one that is learned or fkilled in the law.

LAXATIVE MEDICINES, thofe which loofen the belly, and difpofe a perfon to go frequently to ftool : fuch are all cathartic, emollient, and lubricating medicines. See the articles CATHARTICS, EMOLLIENTS, &c.

LAXEMBURG, a town of Germany, in the circle of Auftria, ten miles fouth of Vienna.

LAY, in french poetry, denotes a fhort poem, fomething like our ballads.

LAY-BROTHERS, among the romanifts, thofe pious, but illiterate perfons, who devote

devote themfelves, in fome convent, to the fervice of the religious. They wear a different habit from that of the religious, but never enter into the choir, nor are prefent at the chapters; nor do they make any other vow, except of conftancy and obedience. In nunneries, there are alfo lay-fifters.

LAY *the land*, at fea, is faid when they get out of fight of land.

LAY-LAND, or LEY-LAND, in hufbandry, fallow ground, or fuch as lies untilled.

LAY-MAN, one who follows a fecular employment, or has not entered into holy orders.

LAY-MAN, among painters, a fmall ftatue either of wax or wood, whofe joints are fo formed, that it may be put into any attitude or pofture. Its principal ufe is for adjufting the drapery in cloathing of figures.

LAYERS, in gardening, are tender fhoots, or twigs of trees, laid or buried in the ground; till having ftruck root, they are feparated from the parent-tree, and become diftinct plants.

Many trees may be thus propagated by layers; the ever-greens about Bartholomew-tide, and other trees about the month of October.

The operation is performed by flitting the branches a little way, and laying them about half a foot under the mould: the ground fhould firft be made very light, and after they are laid, they fhould have a little water given them. If they do not comply well in laying them down, they muft be pegged down with a hook or two; and if they have taken fufficient root by the next winter, they fhould be cut off from the main plants, and planted in the nurfery. Some twift the branch, or bare the rind; and if it be out of the reach of the ground, they faften a tub or bafket near it, which they fill with good mould and lay the branch in it.

LAZAR-HOUSE, or LAZARETTO, a public building, in the nature of an hofpital, to receive the poor and thofe afflicted with contagious diftempers; in fome places, lazarettos are appointed for the performance of quarantine; in which cafe, thofe are obliged to be confined in them who are fufpected to have come from places infected with the plague. This is ufually a large building, at fome diftance from a city, whofe apartments ftand detached from each other, where veffels are unladen, and the crew fhut up for about forty days, more or lefs, according to the time and place of their departure. The lazaretto of Milan is efteemed one of the fineft hofpitals in Italy.

LAZARITES, or *fathers of St.* LAZARUS, a religious congregation of regular clerks, inftituted in France in the feventeenth century, by M. Vincent. They take their name from a houfe in the fuburbs of Paris, where they have a feminary, called the feminary of good children. The vows they make are fimple; and, upon occafion, may be difpenfed with.

LAZULI, or *Lapis* LAZULI, in natural hiftory, one of the ores of copper, the bafis of which is a cryftalline matter, coloured with that elegant blue which copper gives to all alkaline liquors.

It is a very compact and hard ftone, and takes a high polifh, and therefore is worked into a number of toys. It is found in detached lumps of the fize of a man's fift, but often fmaller, and fometimes of four or five pounds weight. It is never covered with any coat or cruft, but refembles thofe ftones which, having been wafhed off from whole ftrata, are rounded by accidents afterwards. It is nuturally of a fmooth and gloffy furface, and its general colour is an elegant blue, but variegated in a beautiful manner with fpots or clouds of white, and with veins of a fine fhining gold-colour.

The lapis lazuli is found in many parts of the world, but that of Afia and Africa is much fuperior both in beauty and real value to the bohemian and german kind, which is too often fold in its place.

Chemical writers give feveral proceffes for magifteries, tinctures, and elixirs of lapis lazuli; but they are wholly out of ufe. Its virtues, in medicine, are thofe of a very violent purgative and emetic, which are owing to the copper it contains; but its violence in the operation has frighted people out of the ufe of it.

Its great ufe therefore, befide the polifhing as a gem, is the making the fine blue ufed in painting, called ultramarine, which is obtained from it by calcination. See the article ULTRAMARINE.

LEA, a river which rifes near Luton in Bedfordfhire, and falls into the Thames a little below Blackwall.

LEAD, *plumbum*, ♄, in natural hiftory, a coarfe, impure metal, called by chemifts faturn. See the article METAL.

Lead is the heavieft of the metals next after

after gold; it is, indeed, confiderably lighter than quickfilver, but the want of malleability denying that fubftance a place in the clafs of metals, lead is among them the fecond in weight. It is the fofteft of all the metals; eafily flattened under the hammer, and ductile in a very great degree, though much lefs fo than gold. Its colour is a pale bluifh grey, it is very little fubject to ruft, and is the leaft fonorous of all the metals, except gold, with which it feems nearly on an equality, in regard to this property in its common ftate; but Mr. Reaumur has difcovered that, if caft in the form of a fegment of a fphere, it has fome found when ftruck upon; a property which gold does not acquire by being caft in the fame form. See the article GOLD.

It requires the leaft degree of fire of all metals, except tin, to put it in fufion. It acquires this fluid ftate, long before it changes its colour; whereas the other metals, except tin, all become red-hot before they run: after melting, it very readily calcines into a grey powder, which, if the fire be increafed and the matter often ftirred, becomes yellow, and afterwards of a fine florid red: this is the minium, or common red lead of the fhops. If the fire be made yet more vehement, it runs into an oleaginous matter, which, as it cools, becomes of a yellowifh or reddifh colour, and is compofed of a number of thin laminæ; this is litharge. Though thefe feveral fubftances have nothing of the appearance of the metal they are produced from, yet, if a little iron-filings be added to them over the fire, or only fome pieces of charcoal, or any other oily inflammable matter be thrown in, they become lead again. The fcoriæ of lead, left to themfelves in a ftrong fire, always run into glafs, and in that form make their way through all forts of veffels.

Lead very readily and eafily amalgamates with mercury, and as readily mixes in fufion with all the other metals, except iron, though lefs eafily with copper than the reft. The fpecific gravity of lead is, to that of water, as 11325 to 1000.

Lead, when in the bowels of the earth, enters into the body of cryftals, as is very frequently the cafe with that cryftal which is found about lead-mines, and influences its figure fo far as to give it a cubic form. It often does this without at all altering its colour; but when it tinges it likewife, the colouring it gives is yellow.

The topaz, among the gems, owes its yellow colour to this metal; and, in the factitious gems, we find that the tinge it gives to the compofition is always a yellow, approaching to that of the topaz.

Lead-ore is readily diftinguifhed to be fuch, being nearly of the colour of lead itfelf, or a little darker; very bright and gloffy when frefh broken; and compofed either of cubic or parallelopiped-maffes, or of fmaller granules, or elfe of ftriæ: in the firft of thefe ftates it is commonly called potter's ore or diced lead-ore; in the fecond, fteel-grained-ore; and in the third, antimoniated ore, from its refemblance to antimony.

Lead is more eafily feparated from its common ore than any other metal; there requires nothing for this purpofe but a common wood-fire, kept up to a due ftrength by a blaft of bellows. The lead-ore is thrown into this fire upon the wood, and the melted metal runs into a hollow at the bottom of the furnace made to receive it, from which they ladle it out and caft it into large maffes. Such ores of lead as contain earth and ftones are to be powdered and wafhed before they are committed to the fire, and fuch as contain pyrites or marcafite, which is no uncommon thing, muft be roafted two or three times, in order to burn away the fulphur they are debafed with; then powdered and wafhed, in order to their being committed to the fire, and finally mixed with the common black flux, if very refractory. See the article FLUX.

If there be any occafion to feparate lead from a mixture of copper in the regulus, nothing is more eafy than to do it by a common fire; the heat of which being enough to melt lead, though not to fufe copper, will run it all off and leave the copper pure behind.

Lead is much ufed in building, efpecially for coverings, gutters, pipes and glazing; for which ufes, it is either caft into fheets in a mould, or millet; which laft is by much the leaft ferviceable, not only on account of its thinnefs, but alfo becaufe it is fo exceedingly ftretched in milling, that when it comes to lie in the hot fun, it fhrinks and cracks, and confequently will not keep out the water. For the manufacture of all which, fee the article PLUMBERY.

Lead has been celebrated by the chemical writers

writers for very great virtues in medicine, but, upon the whole, it ſeems to be a metal very cautiouſly to be given internally, and rather calculated for outward application. Its ore is poiſonous: the ſteam which ariſes from the furnace where it is worked, infects the graſs of all the neighbouring places, and kills the animals that feed on it; and among the preparations of it, the ſalt called ſaccharum ſaturni, which is by much its beſt form for medicine, and which is able to do great ſervice, in hæmorrhages and ſome other caſes; it is apt, however, to bring on colics of a very violent kind, and ſo many other diſorders, that the remedy often proves worſe than the diſeaſe. The preparations of lead, are, 1. Minium, or red-lead. 2. Litharge. 3. Burnt-lead, plumbum uſtum. 4. Ceruſe. 5. Salt, or ſugar of lead, ſaccharum ſaturni. See MINIUM, LITHARGE, CERUSE, and SACCHARUM SATURNI.

Burnt LEAD is thus prepared: cut a quantity of the thinneſt milled lead that can be got into ſmall plates; fill an earthen veſſel, that will bear the fire, with theſe plates and powder of common brimſtone, laid *ſtratum ſuper ſtratum*; ſet it over the fire, and when the ſulphur is burnt away, the lead will be found reduced to a blackiſh powder. Five ounces of ſulphur will ſerve for half a pound of lead. The matter is to be ſtirred while it remains on the fire; and when it is cold, the powder is to be waſhed three or four times with common water, and then dried for uſe; being of the ſame virtue with litharge, or red-lead, in ointments and plaſters. Mixed into an unguent with lard alone, it makes a good ointment for the piles. However, it ought to be remarked, that it is intended only for external uſe.

Beſides the preparations already mentioned, we find mention of balſam and magiſtery of lead. Balm, or balſam of lead, is only an oil drawn, by diſtillation, from ſalt of lead diſſolved in ſpirit of turpentine. Magiſtery of lead is the calx of lead purified and ſubtiliſed in aqua fortis; which, being ſeveral times waſhed, becomes extremely white, and is mixed with pomatums for the face and complexion.

Black LEAD, or MOCK LEAD, *plumbago*. See the article PLUMBAGO.

Glaſs of LEAD. See the article GLASS.

LEAF, *folium*, in the natural hiſtory of plants, a very eſſential and ornamental part of plants, whoſe chief office is to ſubtiliſe and give more ſpirit to the abundance of nouriſhing ſap, and to convey it to the little buds.

Botaniſts conſider the leaves of plants, with regard to their ſtructure, their ſurface, figure, conſiſtence, edges, ſituation and ſize. With regard to their ſtructure, they are either ſingle, as thoſe of the apple-tree and pear-tree; or double, as thoſe of angelica and parſley. With reſpect to their ſurface, they are either flat, as the nummularia and origany; or in bunches, as ſeveral kinds of kali and houſleeks. With regard to their conſiſtence, they are either thin and fine, as thoſe of St. John's wort; or thick and groſs, as thoſe of portulaca; or fleſhy, as thoſe of ſeveral kinds of houſleek; or woolly, as thoſe of gnaphalium. With regard to their edges, leaves are either cut ſlightly, as ſome ſpecies of geums; or deep, as in ſome of the jaceas. With regard to their ſituation, they are either ranged alternately, as the alaternus; or oppoſite to each other, as the phillyrea and the mints. With regard to their ſize, they are either very large, as thoſe of the colocaſia and ſphondylium; or moderate, as thoſe of biſtort and the fig-tree; or ſmall, as thoſe of the apple-tree and pear-tree; or very ſmall, as that of St John's wort.

Moſt ſorts of ſmall plants, and alſo ſeveral ſorts of trees, which put forth a root at the ſmall end of the ſeed, put out two ſmall leaves that are not at all like thoſe that grow on the plant or tree, as ſoon as the root has taken hold of the ground; and afterwards between theſe falſe leaves, there comes forth a ſhoot which produces leaves like thoſe of the plant or tree from which it came: of this manner of growth, there is an infinite number of plants and trees.

Doctor Grew juſtly obſerves, that the fibres of leaves are compoſed of two general kinds of veſſels, *viz.* thoſe for ſap and thoſe for air; and, that theſe are ramefied out of greater into leſs, like the veins and arteries in animals: and all naturaliſts aſcribe to them very important uſes; the moſt ſingular of which is, that they, in ſome meaſure, perform the ſame office for the ſupport of the vegetable life, as the lungs of animals do for the ſupport of animal life; and, that it is highly probable, that plants draw ſome part of their nouriſhment from the air through their leaves. Theſe, in the ſpring,

ſpring, receive the crude humours, divide them very minutely, and carry back great plenty of elaborated juice to the plant. By theſe a tranſpiration is carried on of what is unprofitable, anſwering to the diſcharge in animal bodies made by ſweat; for ſometimes the excretory veſſels of the leaves are ſo over-charged by the great plenty of the diſtending humour, or juice, that they burſt in the middle, and let go the more ſubtile parts; and it frequently happens, that, in a hot ſeaſon, a great plenty of juices are this way diſcharged and imbibed. Thus manna is found to exude as well from the leaves as from the bark, eſpecially if a cold night follows a hot day; and the ſame thing frequently happens in ſeveral other plants and trees, as we learn from the bees flying to the lime-tree, that they may gather that gummous ſubſtance from its leaves; but if the heat be leſs, all the ſuperfluous juices, except thoſe which are, perhaps, tranſmitted by inſenſible perſpiration thro' the arterial veſſels, exhale naturally, and return into the trunk. It is alſo found, that the bibulous veſſels, dried by the diurnal heat, imbibes, eſpecially in the nighttime, thoſe watry vapours which ariſe in form of a very thin dew, and ſo make amends for the loſs made by the arteries, by the new moiſtures received. Laſtly, the leaf ſerves, in a ſingular manner, to nouriſh the eye, or gem, until growing by degrees to a greater bulk, it preſſes the veſſels of the foot-ſtalk together, from whence the humour is, by little and little, ſtopped in the leaf till it cannot any more return thro' the footſtalk; which, by the ceaſing of the afflux and reflux of the nutritious juice, grows putrid, whence a conſumption being cauſed, the leaf dies, and falls off; which is the chief cauſe of the falling of the leaves in autumn.

Some have made the obſervation, that all ever-greens have their wood cloſe and compact between their annular circles; and, that their holding their leaves all the winter, proceeds from the nature of their ſap, which is of a clammy and turpentine nature; and, that this ſap is eaſily condenſed by the cold, and requires a great deal of heat to make it thin and put it in motion: thus a little cold, condenſes or ſtiffens pitch or turpentine, but it muſt be a froſt that ſtays the motion of water. From whence it happens, that thoſe trees which hold their leaves will grow much better under the droppings of other great trees, than ſuch as ſhed their leaves, becauſe their turpentine-ſap ſhoots off the drops, and prevents their entering the veſſels in too great quantities. The various forms and kinds of leaves, as pinnated, digitated, crenated, haſtated, *&c.* are deſcribed under the articles PINNATED, CRENATED, HASTATED, *&c.*

LEAF, in architecture, the repreſentation of the leaf of the acanthus on the capital of the corinthian and compoſite orders. See the articles CORINTHIAN and COMPOSITE.

LEAF, in clocks and watches, an appellation given to the notches of their pinions. See the articles CLOCK and WATCH.

LEAGUE, a meaſure of length, containing more or leſs geometrical paces, according to the different uſages and cuſtoms of countries. A league at ſea, where it is chiefly uſed by us, being a land meaſure moſtly peculiar to the French and Germans, contains three thouſand geometrical paces, or three engliſh miles. The french league ſometimes contains the ſame meaſure, and in ſome parts of France it conſiſts of three thouſand five hundred paces: the mean or common league conſiſts of two thouſand four hundred paces, and the little league of two thouſand. The ſpaniſh leagues are larger than the french, ſeventeen ſpaniſh leagues making a degree, or twenty french leagues, or ſixty-nine and an half engliſh ſtatute miles. The dutch and german leagues contain each four geographical miles. The perſian leagues are pretty near of the ſame extent with the ſpaniſh; that is, they are equal to four italian miles; which is pretty near to what Herodotus calls the length of the perſian paraſang, which contained thirty ſtadia, eight whereof, according to Strabo, make a mile.

LEAGUE alſo denotes an alliance or confederacy between princes and ſtates for their mutual aid, either in attacking ſome common enemy, or in defending themſelves.

LEAGUES *of the Griſons*, are a part of Switzerland, conſiſting of three ſubdiviſions, *viz.* the upper league, the league of the houſe of Gad, and the league of the ten juriſdictions. See the article SWITZERLAND.

LEAK, among ſeamen, is a hole in the ſhip through which the water comes in. To ſpring a leak, is ſaid of a ſhip that begins to leak. To ſtop a leak, is to fill it

it with a plug wrapt in oakam and well tarred, or putting in a tar-pawling clout, to keep the water out; or nailing a piece of sheet-lead upon the place.

LEAKAGE, the state of a vessel that leaks, or lets water, or other liquid, ouze in or out. See the preceding article.

Leakage, in commerce, is an allowance of 12 *per cent.* in the customs, allowed to importers of wines for the waste and damage it is supposed to have received in the passage: an allowance of two barrels in twenty-two is also made to the brewers of ale and beer, by the excise-office.

LEAOTUNG, the most northerly part of China, in Asia. See CHINA.

LEAP, *salto*, in music, is when the song does not proceed by conjoint degrees, as when between each note there is an interval of a third, fourth, fifth, &c. See the articles DEGREE and CONJOINT.

It is to be observed, that there are two kinds of leaps; the regular leaps and the irregular ones. Regular leaps, are those of a third major or minor, whether natural or accidental, fourth, fifth, sixth, minor and octave, and these either ascending or descending. Irregular leaps, are the tritone, sixth major, seventh major, the ninth, tenth, and, in general, all beyond the compass of an octave, unless it be for instruments.

Besides these, there are some that may be used with discretion, as the fourth diminished, the fifth false or defective, and flat seventh; but mostly descending, very seldom rising. In effect, all the difference between the regular and irregular leap, is, that these which are easily performed by the voice, without any great struggle or effort, are regular, as the contrary are irregular. These last should be very seldom used in a song, unless there is a silence between them long enough to weaken the idea of the first sound before the second be heard.

LEAP-YEAR, the same with bissextile. See the article BISSEXTILE.

Every centesimal, or hundredth year, is a leap-year, according to the Julian account, but according to the gregorian, it is always a common year, except when the number of centuries can be divided by 4 without a remainder, for then it is a leap-year; but the intermediate centesimal years are common ones: hence, to know if it be leap-year, the rule is, If the year consists of complete centuries, and can be divided by 4, it is leap-year; as it is also, when the intermediate years can be divided by 4: thus the year 1756 was a leap-year; for 56 may be divided by 4, without a remainder. If the intermediate years cannot be divided by 4, the remainder shews the number of years over leap-year.

LEARMOUTH, a market-town of Northumberland, situated forty-eight miles north-west of Newcastle, and twelve south-west of Berwick.

LEASE, in law, a demise or letting of lands, tenements, or hereditaments unto another for life, term of years, or at will, for a rent reserved.

All estates, or terms for years, in lands, &c. which are not reduced into writing and signed by the parties, shall have no greater effect than as estates at will, unless it be leases of terms not exceeding three years from the making. In case the substance of a lease that exceeds three years be put in writing, and signed by the parties, though such a lease be not sealed, it will have the effect of a lease for years. If articles of agreement are made wi h covenants to make a lease for a certain term under a particular rent reserved, this seems to imply a lease, and has been so adjudged. The words, *to have and possess lands*, in consideration of a yearly rent, will make a lease of the land; also a licence to occupy and take the profits, &c. amounts to a lease. A husband may make such leases of lands held in tail in the right of his wife, provided that she be made a party thereto. Where a person has an estate for life, he is at liberty to grant a lease during such estate. One interested in lands, &c. for a term of years, may make a lease of all the years except one day, or other short part of the term: for it must be granted for a less time than the lessor has in the lands, otherwise it will be an assignment. By the common law, a lease for life cannot be made so as to commence in futuro, for this reason, that livery cannot be made to a future estate, though a lease for term of years may begin either on a day past or to come, as at Michaelmas last, or Christmas next, &c.

LEASE and RELEASE, as used in our law, signifies a certain instrument in writing, for the conveyance of a right or interest in lands and tenements in fee to another. In the making of this conveyance, a lease or bargain and sale for a year, bearing date the next day before the date of the release, is first executed, to the intent that by

by virtue thereof, and of the ſtatute made for transferring of uſes into poſſeſſion, the leſſee may be in the actual poſſeſſion of the lands, *&c.* intended to be granted by the releaſe, and to be thereby enabled to take a grant of the reverſion and inheritance of the ſaid lands, *&c.* to him, his heirs and aſſigns for ever: after which the releaſe muſt be executed, reciting the leaſe or bargain and ſale, and declaring the uſe.

A releaſe made by a perſon, that at the time of the making thereof had no right to the lands, is void in law; as it is likewiſe when made to a man who at the time of its making hath nothing in the lands; for he ought to have either a freehold therein, or a poſſeſſion or privity.

A leaſe and releaſe being only in the nature of one deed, make but one conveyance.

The releaſe conſiſts of the following principal parts, *viz.* the names of the parties, their places of abode, and their additions; the conſideration and granting part, with the particulars of what is granted; the habendum, or explanatory clauſe, ſhewing what intereſt is granted, to whom, and for what uſe: then a covenant that the releaſor is lawful owner, is ſeized in fee, and hath a good right to grant, *&c.*

LEASH, among ſportſmen, denotes three creatures of any kind; but chiefly greyhounds, foxes, bucks and hares.

The term leaſh alſo ſignifies a line to hold in a hunting dog; and a ſmall long thong of leather, by which a falconer holds his hawk.

LEATHER, the ſkin of ſeveral ſorts of beaſts dreſſed and prepared for the uſe of the various manufacturers, whoſe buſineſs it is to make them up. The butcher and others, who flay off their hides or ſkin, diſpoſe of them raw or ſalted to the tanner and tawyer, and they to the ſhamoy, morocco, and other kind of leather-dreſſers, who prepare them according to their reſpective arts, in order to diſpoſe of them among the curriers, glovers, harneſs-makers, coach-makers, ſaddlers, breeches-makers, gilt leather-makers, chair-makers, ſhoe-makers, book-binders, and all in any way concerned in the article of leather.

The three principal aſſortments of leather are tanned or tawed, and oil and alum-leather; and it may be affirmed, with great truth, that the ſkins of our own production, and thoſe imported from our colonies, when dreſſed in this kingdom, make the beſt leather in the world, and that therefore this is an article of great importance to the trade of the nation.

Though there is no little difference between the dreſſing of ſhamoy-leather, alum-leather, hungary leather, morocco leather, parchment, and tanning; yet the ſkins which paſs through the hands of theſe ſeveral workmen, ought to have been for the moſt part, at leaſt, waſhed clean from blood and impurities in a running water; ſet to drain, worked with the hands, or pounded with wooden peſtles in a vat; put into the pit (which is a hole lined either with wood, or with ſtone and mortar) filled with water in which quick-lime is diſſolved, in order to looſen the hair, that it may be eaſily rubbed off without injuring the ſkin; drawn out, and ſet to drain on the edge of the pit; ſtretched on the leg or horſe, in order to have the hair ſcraped off with a blunt iron-knife, or wooden cylinder; the membranes on the fleſhy ſide, and the ſcabs or roughneſs on the grain-ſide, pared off with a ſharp knife, and the ſkins rubbed with a whetſtone, to take off any particles of the lime, or any thing elſe that may occaſion hardneſs; thickened by different ſorts of powder, whereby they become greater in bulk, and ſo much lighter, as gradually to riſe to the ſurface of the water; ſtretched out green or half dried, and piled one over another; or put up ſeparate after they are dried, and hung out to air upon poles, lines, or any other way: which muſt be repeatedly done in the dreſſing of ſmall ſkins. This alternate tranſition from the liquid of the air into that of water, and from water into the air, with the aſſiſtance of lime, ſalts, and oils, opens the inmoſt fibres of the ſkin ſo effectually, as greatly to facilitate the introduction of ſubſtances proper for making them pliant without rendering them thinner.

The alum leather-dreſſer dreſſes all ſorts of white leather from the ox-hide to the lamb ſkin; for dreſſing the ſadler's leather, he uſes bran, ſea-ſalt, and alum; and for that which the glover uſes, after the common preparatives, he firſt employs bran, and then with ſalt, alum, fine flower, and yolks of eggs mixed in hot water, he makes a ſort of pap, with which the ſkins are ſmeared in a trough.

The ſhamoy leather-dreſſer ſoaks in oil, not only the ſkins of the true ſhamoy, which

which is a wild goat, but likewife thofe of all other goats. The tanner ufes the bark of young oaks ground in a tanning mill, in which he foaks the fkins more or lefs, according to the different fervices expected from them, their chief ufe being to remain firm and keep out water. In certain cafes, inftead of tan, he ufes redon, which is chiefly ufed for tanning ram, fheep-fkins, and dreffing ruffia leather. But for the different methods in which the tanner, currier, ruffia and morocco leather-dreffers proceed in finifhing their fkins, fee the articles CURRYING, TANNING, &c. and for the duties on leather and fkins, fee the articles EXCISE, FURR, &c.

Colouring of LEATHER. To colour white leather, the beft way. Hang the fkins in chalk or lime-water, till they are grown fupple, that the hair or wool may be ftripped off; ftretch them on tenters, or by means of lines, and fmooth them over: then brufh them over with alum-water very warm, and colour them with the colour you would have them, and dry them in the fun, or in fome warm houfe, and they will be ufeful on fundry occafions, without any farther trouble.

To colour black-leather the German way. Take of the bark of elder two pounds, of the filings or ruft of iron the fame quantity; put them into two gallons of rain-water, and ftop them up clofe in a cafk or veffel, and let them ftand for the fpace of two months: then add to that the liquid part of a pound of nut-galls, beaten to powder, and a quarter of a pound of copperas, heating them over the fire, and fuffering them to ftand 24 hours after; and then ufe the liquor with a brufh till the fkin has taken a fine black.

To colour leather a fair red. Firft rub the leather well in alum-water, or alum it; boil ftale urine, fcum it, till half of it is wafted: then put in an ounce of the fineft lake, the like quantity of brazil in powder, one ounce of alum, and half an ounce of fal-armoniac; mix them well, and keep them ftirring over a gentle fire about two hours, and fo ufe the liquid part, to colour or tinge the fkins.

To colour leather of a curious french yellow. Take one part of chalk, and another of wood-afhes, and make of them a good lye; then ftrain out the fine liquor, and fet it in a veffel over the fire, and put into it turmeric in powder, and a little faffron; and let it fimmer, till it becomes pretty thick; then fet it a cooling, to be ufed as occafion requires.

To make white leather blue. Take a quart of elder berries, ftrain out the juice, and boil it with an ounce of powder of alum, and half an ounce of indigo, or fmalt-blue, and brufh over the leather with a fine brufh dipped in it three times, fuffering it to dry between whiles, and the bufinefs will be effected.

To colour fpanifh leather, &c. Take that which the Dutch call pomplemelch, warm it, and rub the leather with it; then take of venice tot appelen, and having pounded it fmall, put a quantity of water to it, and let it foften over a gentle fire; then prefs out the water, and rub or wafh out the fkin in it; repeating the fame feveral times; and after that, take the fineft fhoemakers black, and rub the fkin over with it, having in the melting added a little vitriol or copperas, and letting it dry, take goofe or hog's greafe, and with a woollen cloth rub the fkin over for a good while, where there is a good fire to fupple it, and afterwards rub it over with your hands, till it difappear; or inftead of greafe, you may ufe linfeed or train-oil, and fo in cafe of any other colour, according to the colours you defign.

Dying of LEATHER. To dye leather of a reddifh colour. Firft wafh the fkins in water, and wring them out well, and afterwards wet them with a folution of tartar and bay-falt in fair water, and wring them out again: then to the former diffolution add afhes of crab-fhells, and rub the fkins very well with this: afterwards, wafh them in common water, and wring them out; then wafh them with tincture of madder in the folution of tartar and alum and the crab-fhell afhes: and if they prove not red enough after all, wafh them with the tincture of brazil.

To dye leather of a pure yellow. Take of fine aloes two ounces, of linfeed-oil four pounds; diffolve or melt them; then ftrain the liquor, and befmear the fkins with it, and being dry, varnifh them over.

To dye fkins of an orange. Boil fufticberries in alum-water: but for a deep orange, ufe turmeric-root.

To dye leather blue. Boil elder-berries, or dwarf-elder in water; then fmear or wafh the fkins with it; wring them out; then boil the berries as before in a folution of alum-water, and wet the fkins in the fame water once or twice;

dry them, and they will be very blue.

To dye leather of a pure ſky-colour. For each ſkin take indigo one ounce, put it into boiling water, let it ſtand one night; then warm it a little, and with a bruſh-pencil beſmear the ſkin twice over.

To dye leather purple. Diſſolve roch-alum in warm water, wet the ſkins with it, dry them; then boil raſped brazil well in water; let it ſtand to cool: do this three times, and afterwards rub the dye over the ſkins with your hand, and when they are dry, poliſh them.

To dye leather green. Take ſap green and alum-water, of each a ſufficient quantity; mix and boil them a little; if you would have the colour darker, add a little indigo.

Gilding of LEATHER. Take glair of the whites of eggs or gum-water, and, with a bruſh, rub over the leather with either of them; then lay on the gold or ſilver, and letting them dry, burniſh them. See the articles GILDING and BURNISHING.

To dreſs or cover leather with ſilver or gold. Take brown red, grind or move it on a ſtone with a muller, adding water and chalk, and when the latter is diſſolved, rub or lightly dawb the leather over with it, till it looks a little whitiſh, and then lay on the leaf, ſilver or gold, before the leather is quite dry, laying the leaves a little over each other, that there may not be the leaſt part uncovered; and when they have well cloſed with the leather, and are ſufficiently dried on, and hardened, rub them over with an ivory poliſher, or the fore-tooth of a horſe.

For the duties on LEATHER, ſee the articles HIDES, SKINS, &c.

LEAVEN, a piece of ſour dough, uſed to ferment and render light a much larger quantity of dough or paſte.

LEAVER, or LEVER, in medicine. See the article LEVER.

LEBUS, a town of Germany, in the marquiſate of Brandenburg, ſituated on the river Oder: eaſt long. 15°, north lat. 52° 30′.

LECCIE, a city of Italy, in the kingdom of Naples, and territory of Otranto: eaſt long. 19°, north lat. 40° 32′.

LECCO, a town of Italy, in the dutchy of Milan: eaſt long. 9° 40′, north lat. 45° 45′.

LECH, a river of Germany, which riſes in Tyrol, and running north, divides Swabia from Bavaria, and having paſſed by Landſprug and Augſburg, falls into the Danube below Donawert.

LECH is alſo a river of Holland, which runs from eaſt to weſt through the provinces of Gelderland and Utrecht, and uniting with the waters of the Maes, falls into the German ſea, near the city of Briel.

LECHEA, in botany, a genus of the triandria-monogynia claſs of plants, the calyx of which is a three-leafed perianthium; the leaves are concave, patent and permanent; the corolla conſiſts of three oblong leaves, narrower than the cup; the fruit is an oval, three-cornered capſule, compoſed of three valves, and containing three cells, in which is a ſingle oval ſeed.

LECHIA, in ichthyology, the ſcomber, with two fins on the back, and the laſt ray on the hinder fin very long. See the article SCOMBER.

LECHLADE, a market-town of Glouceſterſhire, ten miles eaſt of Cirenceſter.

LECHNICH, a town of Germany, in the circle of the Lower Rhine, and electorate of Cologn: eaſt long. 6° 35′, north lat. 50° 40′.

LECLUSE, a town of the french Netherlands, in the province of Flanders, five miles ſouth of Doway: eaſt long. 3°, north lat. 50° 20′.

LECTICA, in roman antiquity, a vehicle in which people were carried in a reclining poſture.

LECTISTERNIUM, a religious feaſt or banquet of the antient Romans. In times of public danger or calamity, or of thankſgiving for ſome happy event, the republic ordered ſolemn feaſts to be made for the gods; and this ſolemnity was called lectiſternium, becauſe on this occaſion they ſpread tables, and placed beds around them, on which their heavenly gueſts were to lie and eat. Theſe beds were placed near the altars; they were ſtrewed with leaves and odoriferous herbs; cuſhions were laid for the gods to reſt their heads upon, and their ſtatues laid upon theſe beds as if they were to partake of the feaſt: while the goddeſſes were placed in chairs, after the manner of the roman ladies. During the time this religious ceremony laſted, the Romans crowded to the temples; and the ſenators, preceded by the pontifex maximus, came to the place where the ceremony was performed, with crowns on their heads, ſinging hymns in praiſe of the gods, whoſe ſtatues were carried in tri-

umph

umph in chariots and on biers, accompanied with mufic.

LECTOUR, a city of France, in the province of Gafcony: eaft long. 25′, north lat. 44°.

LECTURERS, in England, are an order of preachers in parifh-churches, diftinct from the rector or vicar. They are chofen by the veftry, or chief inhabitants of the parifh, and are ufually the afternoon preachers.

The law requires, that they have the approbation and admiffion of the ordinary, and that at the time of their admiffion, they fubfcribe to the thirty-nine articles of religion, &c. required by the ftatute, 14 Car. II. and they are to be licenfed by the bifhop, like other minifters.

Where there are lectures founded by the donations of pious perfons, the lecturers are appointed by the founders, without any interpofition or confent of rectors of churches, &c. though with the leave and approbation of the bifhop; fuch as that of lady Moyer, at St. Paul's.

LEDBURY, a market-town of Herefordfhire, thirteen miles eaft of Hereford.

LEDESMA, a town of Spain, in the province of Leon, fituated on the river Tormes, eighteen miles weft of Salamanca: weft long. 6° 35′, north lat. 41° 15′.

LEDGES, in a fhip, are fmall pieces of timber lying a-thwart from the wafte-trees to the roof trees: they ferve to bear up the gratings or nettings over the half-deck. See the article SHIP.

LEDGER, the principal book wherein merchants enter their accounts. See the article BOOK.

LEDUM, the MARSH-CISTUS, in botany, a genus of the decandria-monogynia clafs of plants, the corolla whereof confifts of five hollow, patent, oval petals; the fruit is a roundifh capfule, containing five cells and opening in five places at the bafe; the feeds are numerous, oblong, narrow-pointed at each end, and very flender.

LEE, in the fea-language, a word of various fignifications; though it is generally underftood, to mean the part oppofite to the wind. Thus *lee fhore*, is that fhore againft which the wind blows. *Lee-latch*, or have a care of the lee-latch, is, take care that the fhip don't go to the leeward, or too near the fhore. *A lee the helm*, put it to the leeward fide of the fhip. *To lie by the lee*, or to come up to the lee, is to bring the fhip fo, that all her fails may lie flat againft her mafts and fhrouds, and that the wind may come right upon her broad-fide.

LEE-FANG, is a rope reeved into the cringles of the courfes, to hale in the bottom of the fail, that the bonnets may be laced on, or the fail taken in.

LEE-WAY, is the angle that the rhumb-line, upon which the fhip endeavours to fail, makes with the rhumb upon which fhe really fails.

This is occafioned by the force of the wind, or furge of the fea, when fhe lies to the windward, or is clofe hawled; which caufes her to fall off and glide fide-ways from the point of the compafs fhe capes at. Thus, let N E S W (plate CLV. fig. 2. n° 1.) reprefent the compafs, and fuppofe a fhip at C capes at, or endeavours to fail upon the rhumb C a, but by the force of the wind and furge of the fea fhe is obliged to fall off, and make her way good upon the rhumb C b; then the angle a C b is the lee-way: and if that angle be equal to one point, the fhip is faid to make one point lee-way; or if equal to two points, the fhip is faid to make two points lee-way, &c.

The quantity of this angle is very uncertain; becaufe fome fhips, with the fame quantity of fail, and with the fame gale, will make more lee-way than others; it depending much upon the mould and trim of the fhip, and the quantity of water that fhe draws. However, the common allowances made for lee-way, are thefe: 1. If the fhip be clofe hauled, has all her fails fet, the water fmooth, and a moderate gale of wind, fhe is fuppofed to make little or no lee-way. 2. If it blow fo frefh, as to caufe the fmall fails to be handed, it is ufual to allow one point. 3. If it blow fo hard, that the tops muft be clofe reeft, the fhip then makes about two points lee-way. 4. If one topfail muft be handed, it is common to allow two and three quarters or three points lee-way. 5. When both topfails muft be handed, they allow about four points lee-way. 6. When it blows fo hard, as to occafion the fore-courfe to be handed, the allowance is between five and a half and fix points. 7. When both main and fore courfes muft be handed, then fix or fix and a half points muft be allowed for her lee-way. 8. When the mizzen is handed, and the fhip is trying a hull, fhe then makes her way good about one point before the beam, that is, about feven points lee-way.

Though thefe rules are fuch as are generally

rally ufed, yet as the lee-way depends much upon the mould and trim of the fhip, we fhall here give the method of afcertaining it by obfervation: thus let the fhip's wake be fet by a compafs in the poop, and the oppofite rhumb is the true courfe made good by the fhip; then the difference between this and the courfe given by the compafs in the bittacle, is the lee-way required. If the fhip be within fight of land, the lee-way may be exactly found by obferving a point on the land which continues to bear the fame way; for the diftance between the point of the compafs it lies on, and the point the fhip capes at, will be the lee-way. Thus, fuppofe a fhip at C (*ibid.* n° 2.) is lying up N*b*W, towards A; but inftead of keeping that courfe fhe is carried on the NNE line CB, and confequently the point B continues to bear always the fame way from the fhip: here it is evident, that the angle ACB, or the diftance between the N*b*W line that the fhip capes at, and the NNE line that the fhip really fails upon, will be the lee-way. See the articles COMPASS, COURSE, JOURNAL, &c.

LEECH, *hirudo*, in zoology. See the article HIRUDO.

Leeches, ufed for bleeding, fhould be chofen from clear and running waters, for thofe from ftagnant ones, and dirty ponds, feem to have fomething malignant in the bite. The furgeons ufually choofe fuch as have flender heads, green lines on their backs, and bellies of a reddifh yellow. But from whatever waters thefe creatures have been taken, the beft method is to keep them many days in a glafs of water, changing it often, that they may cleanfe themfelves. Before the leech is applied to the fkin, it fhould be taken out of the water, and kept an hour in an empty cup, to drain itfelf, that it may thus be rendered thirfty and empty. The fkin too muft be well rubbed, till it become hot and red, and then either hold the leech by the tail to the part, or let it crawl of itfelf out of the cup upon it. By this means they readily lay hold; but if they refufe, the blood of a chicken or pigeon fhould be rubbed on the part; and if that does not allure them, they muft be laid afide as ufelefs, and others taken in their ftead. They may be properly applied to the temples, or behind the ears, in diforders of the head, and to the veins of the rectum in the blind piles. And applied to this part alfo, they often prove of great fervice in hæmorrhages at the nofe, or fpittings of blood, efpecially when thefe have been occafioned by a ftoppage of the ufual difcharges that way; though where that is not the cafe, they do great fervice merely by revulfion.

If much blood is required to be drawn, the tails of the leeches may be cut off as they are fucking, by which means, the blood they have already fucked will be difcharged, as well as what they continue to take in; for they will not let go their hold, but continue fucking as before.

If they do not let go after a fufficient quantity of blood is drawn, they are not to be pulled off, for that often occafions tumours and inflammations; but if a little falt be fprinkled on the place, they quit their hold. The orifices fhould be wafhed with warm wine or water, and they ufually heal of themfelves.

LEEDS, a large market-town in the weft riding of Yorkfhire, fituated on the river Aire, twenty miles fouth-weft of York: it has a very great woollen trade.

LEEK, a garden-plant, called by botanifts porrum. See the article PORRUM.

Leeks are commonly fown along with onions; the onions growing up firft are pulled up, fo that the leeks have room to grow to their full fize.

Great-houfe LEEK, and *tree houfe* LEEK, in botany, the Englifh names of two different fpecies of the fempervivum. See the article SEMPERVIVUM.

LEEK, in geography, a market-town fixteen miles north of Stafford.

LEER, in glafs making, a furnace where the veffels are allowed to cool by degrees. See the article GLASS.

LEERDAM, a town in the province of Holland, feventeen miles north-eaft of Dort: eaft long. 5°, north lat. 51° 50′.

LEERWICK, a town of Scotland, in Main-land, one of the iflands of Shetland, in the county of Orkney: weft long. 30′, north lat. 61° 20′.

LEES, according to Boerhaave, are the more grofs and ponderous parts of liquors, which, being feparated by fermentation, fall to the bottom.

If this feculent matter be dried, and afterwards burnt in a naked fire, it affords faline afhes, from whence a fixed and fomewhat or even truly alkaline falt may be obtained; whence it is evident, that the moft perfect fermentation cannot volatilize that matter of vegetables, which

is fixed by burning in the fire. See the article FERMENTATION.

A ſpirit of a very agreeable flavour is obtained, by the common proceſs of diſtillation, from wine lees; and as this flavour depends greatly on the eſſential oil of the lees, care ſhould be taken to bring it over with the ſpirit. In order to this, the ſolid lees muſt be ſteeped in ſix or eight times their own weight of water, and well ſtirred at times, before it is put into the ſtill. See DISTILLATION.

LEET, *leta*, a little court held within a manor, and called the king's court, on account, that its authority to puniſh offences originally belonged to the crown, from whence it is derived to inferior perſons. See the article COURT-LEET.

LEETCH *of a ſail*, is the outward edge or ſkirt of the ſail from the earing to the clew; or the middle of the ſail, between the earing and the clew.

LEETCH-LINES, ſmall ropes made faſt to the leetch of the topſails, to which they belong, and reeved into a block at the yard cloſe by the topſail-ties. They ſerve to hale in the leetch of the ſail when the topſails are to be taken in.

LEEWARD, at ſea, the ſide oppoſite to that on which the wind blows. See the article LEE.

LEEWARD-SHIP, one that makes a great deal of lee way. See LEE-WAY.

LEEWARD-ISLANDS, in America, a name given to the Caribbees.

LEG, *crus*, in anatomy, the whole lower extremity from the acetabula of the oſſa innominata, commonly divided into three parts, *viz.* the thigh, the leg properly ſo called, and the foot. See the articles THIGH and FOOT.

The leg conſiſts of three bones, the tibia, fibula, and rotula; or, as it is otherwiſe called, the patella. See the articles TIBIA, FIBULA, *&c.*

For the arteries, veins, nerves, and muſcles of the leg, ſee the articles ARTERY, NERVE, VEIN, and MUSCLE.

LEGACY, ſignifies any thing that is particularly given or bequeathed by a laſt will and teſtament. See the articles WILL and TESTAMENT.

The perſon to whom ſuch a legacy is left, is termed the legatee. There is a reſiduary legatee, or one to whom, after ſeveral deviſes or bequeſts made by will, the reſidue of the teſtator's eſtate and effects are given. See DEVISE.

On a deviſe of a ſum of money to be paid a perſon at the age of twenty-one years, or on the day of marriage, if the legatee die before either of theſe happen, his adminiſtrator ſhall have the legacy. See the article ADMINISTRATOR.

If a legacy is bequeathed, and no certain time of payment mentioned, and the legatee is an infant, he ſhall be intitled to intereſt for his legacy from the expiration of a year after the death of the teſtator, which time is allowed an executor to ſee whether there be any debts; but it is otherwiſe when the legatee is of full age, in ſuch a caſe he ſhall not have any intereſt, but from the time of the demand of the legacy; and if the legacy given is payable at a certain day, it muſt be paid with intereſt from that day.

LEGATE, a cardinal or biſhop, whom the pope ſends as his embaſſador to ſovereign princes. See EMBASSADOR.

There are three kinds of legates, *viz.* legates a latere, legates de latere, and legates by office, or legati nati: of theſe the moſt conſiderable are the legates a latere, the next are the legates de latere. See the article LATERE.

Legates by office are thoſe who have not any particular legation given them, but who by virtue of their dignity and rank in the church, become legates: ſuch are the archbiſhop of Rheims and Arles: but the authority of theſe legates is much inferior to that of the legates a latere.

The power of a legate is ſometimes given without the title. Some of the nuncios are inveſted with it. It was one of the eccleſiaſtical privileges of England from the norman conqueſt, that no foreign legate ſhould be obtruded upon the Engliſh, unleſs the king ſhould deſire it upon ſome extraordinary emergency, as when a caſe was too difficult for the engliſh prelates to determine.

LEGATUS, in roman antiquity, a military officer who commanded as deputy of the chief general. The deſign of the legati at their firſt inſtitution, was not ſo much to command as to adviſe. They were choſen by the conſuls, the authority of the ſenate concurring with their nomination. There were two kinds of legati, *viz.* a legatus in the army, under the imperator or general, who commanded in chief under him, and managed all affairs by his permiſſion; and a legatus in the provinces, under the proconſul or governor, in whoſe abſence the legatus had the honour to uſe the faſces, and was intruſted with the ſame charge as the officer he repreſented. As to the number

ber of the legati we have no certainty, but may ſuppoſe that this depended upon the pleaſure of the general, &c. Under the emperors, there were two ſorts of legati, conſulares and prætorii; the firſt of whom commanded whole armies, as the emperor's lieutenant-generals; and the others, only particular legions.

LEGEND, any idle or ridiculous ſtory told by the romaniſts concerning their ſaints, and other perſons, in order to ſupport the credit of their religion.

The legend was originally a book uſed in the old romiſh churches, containing the leſſons to be read at divine ſervice: hence the lives of the ſaints and martyrs came to be called legends, becauſe chapters were read out of them at matins, and in the refectories of religious houſes. Among theſe the golden legend, which is a collection of the lives of the ſaints, was received by the church with great applauſe, which it maintained for two hundred years; though it is ſo full of ridiculous and romantic ſtories, that the romaniſts themſelves are now aſhamed of it.

But beſides theſe written legends, there are others which may be called traditionary: theſe are thoſe idle ſtories with which every traveller is entertained in his paſſage through popiſh countries. Thus at Mentz, in Germany, they relate, that a drunken man ſwore that he would kill the firſt man he met, and a crucifix coming by, he ſtruck at it with his ſword, which drew blood from the crucifix; and to heighten the wonder, they add, the fellow immediately ſunk up to the knees in the ground, where he ſtood till he was apprehended by the magiſtrates.

LEGER-LINE, in muſic, one added to the ſtaff of five lines, when the aſcending or deſcending notes run very high or low: there are ſometimes many of theſe lines both above and below the ſtaff, to the number of four or five.

LEGGIARDO, or LEGGIARDAMENTE, in muſic, ſignifies to play or ſing in a lively, briſk, and gay manner.

LEGHORN, or LIVORNO, a port-town of Italy, in the dutchy of Tuſcany, ſituated on the Tuſcan ſea, forty miles weſt of Florence: eaſt long. 11°, north lat. 43° 30′.

LEGION, in roman antiquity, a body of foot which conſiſted of ten cohorts.

The exact number contained in a legion, was fixed by Romulus at three thouſand; though Plutarch aſſures us, that after the reception of the Sabines into Rome, he encreaſed it to ſix thouſand. The common number afterwards, in the firſt times of the free ſtate, was four thouſand; but in the war with Hannibal, it aroſe to five thouſand, and after this it is probable that it ſunk again to four thouſand, or four thouſand two hundred, which was the number in the time of Polybius.

They borrowed their names from the order in which they were raiſed, as prima, ſecunda, tertia; but becauſe it uſually happened that there were ſeveral primæ, ſecundæ, &c. in ſeveral places, they, on that account, took a ſort of ſurname beſides, either from the emperors who firſt conſtituted them, as Auguſta, Claudiana, Galbiana; or from the provinces which had been conquered chiefly by their valour, as Parthica, Scythica, Gallica, &c. or from the names of the particular deities, for whom their commanders had an eſpecial honour, as Minervia and Apollinaris; or from the region where they had their quarters, as Cretenſis, Cyrenaica, Britannica, &c. or ſometimes upon account of leſſer accidents, as Adjutrix, Martia, Fulminatrix, Rapax, &c. See COHORT, MANIPULUS, &c.

LEGISLATOR, a law-giver, or perſon who eſtabliſhes the polity and laws of a ſtate. Such was Moſes, among the Jews; Lycurgus, among the Lacedæmonians, &c.

With us, the legiſlative power is lodged in the king, lords, and commons aſſembled in parliament. See PARLIAMENT.

LEGITIMATION, an act whereby illegitimate children are rendered legitimate. See the article BASTARD.

LEGUME, *legumen*, among botaniſts, denotes a pericarpium of an oblong compreſſed figure, formed of two valves, joined by a viſible ſuture both on the upper and under parts, and having the ſeeds affixed to the upper limbs of the two valves, in an alternate order.

LEGUMINOUS, an appellation given to all plants whoſe fruit is a legume. See the preceding article.

LEICESTER, the county-town of Leiceſterſhire, ſends two members to parliament: weſt long. 1° 5′, and north lat. 52° 40′.

LEIGH, a market-town thirty-two miles ſouth-eaſt of Lancaſter.

LEIGHTON BUZZARD, a market-town of Bedfordſhire, fifteen miles ſouth of Bedford.

LEIN-

LEININGEN, a town of Germany, seventeen miles south of Worms.

LEINSTER, a province of Ireland, the capital of which is Dublin.

LEIPSIC, a rich and populous city of Germany, in the circle of Upper Saxony, and province of Misnia: east long. 12° 40′, north lat. 51° 20′.

LEITH, a port-town of Scotland, about two miles north of Edinburgh.

LEMBURG, LEOPOLIS, a city of Poland, and capital of the provence of Red Russia: east long. 24°, north lat. 49°.

LEMGOW, a town of Westphalia, twenty miles north of Paderborne.

LEMING, in zoology, the short-tailed mus, with the body variegated with black and tawney, being the same with the Norway-rat. See NORWAY and MUS.

LEMMA, in mathematics, a proposition which serves previously to prepare the way for the more easy apprehension of the demonstration of some theorem, or construction of some problem.

LEMNA, DUCKWEED, in botany, a genus of the cryptogamia class of plants, producing distinct hermaphrodite and female flowers; neither of which have any flower petals: the stamina are two subulated filaments; and the fruit is a globose, unilocular capsule.

LEMNOS, an island of the Archipelago, situated forty miles south-west of the entrance of the Hellespont: east long. 26°, north lat. 29°.

It is remarkable for producing the bole called lemnian earth, which is a good astringent and vulnerary. See BOLE.

LEMON, *limon*, in botany, a tree comprehended by Linnæus among the citrons. See the article CITRUS.

The medicinal virtues of lemons are the same with those of oranges, only in a greater degree. See ORANGE.

LEMONADE, a liquor prepared of water, sugar, and lemon or citron juice: it is very cooling and grateful.

LEMSTER, a borough-town of Herefordshire, twelve miles north of Hereford.

LEMURIA, a festival of the antient Romans, solemnized on the ninth of May, to pacify the manes of the dead, who were the lemures or phantoms that came in the night to torment the living. The chief ceremony of this festival was as follows: about midnight, the person who offered it, being barefooted, made a signal, by joining the fingers of his hand to his thumb, which he fancied kept off the bad spirit or phantom: he then washed his hands in spring-water, and putting black beans into his mouth, threw them behind him, uttering these words, *I deliver myself and mine by these beans*: he then made a great noise with brass-kettles and pans, desiring the ghost nine times to depart from his house; with which the ceremony ended. The celebration of the lemuria lasted three nights, during which time the temples of the gods were shut up, and no marriages were allowed to be celebrated.

The institution of this festival is ascribed to Romulus, who, to rid himself of the ghost of his brother Remus, which was perpetually appearing to him, ordained a feast to pacify it; whence it is likewise called remuria.

LENA, a great river of Siberia, running north from north lat. 55° to 72°.

LENÆA, Λήναια, in antiquity, a festival of Bacchus, surnamed Lenæus from ληνὸς, i. e. a vine-press. Besides the usual ceremonies at feasts sacred to this god, it was remarkable for poetical contentions, and tragedies acted at this time.

LENCICIA, a city of great Poland, seventy miles west of Warsaw.

LENITIVE MEDICINES, among physicians, those of a mild, softening, and relaxing nature, and destitute of all acrimony.

LENS, in dioptrics, properly signifies a small roundish glass, of the figure of a lentil; but is extended to any optic glass, not very thick, which either collects the rays of light into a point, in their passage through it, or disperses them further apart, according to the laws of refraction.

Lenses have various figures, that is, are terminated by various surfaces, from which they acquire various names. Some are plane on one side, and convex on the other, as that marked A, in plate CLV. fig. 3. n° 1. others convex on both sides, as B, *ibid.* both which are ordinarily called convex lenses: though where we speak accurately, the former is called plano-convex. Again, some are plane on one side, and concave on the other, as C, *ibid.* and others are concave on both sides, as D, *ibid.* which are both usually ranked among the concave lenses; tho' when distinguished, the former is called a plano-concave. Others, again, are concave on one side, and convex on the other, as E, *ibid.* which are called convexo-concave, or concavo-convex lenses,

lenses, according as the one or the other surface is more concave, or a portion of a less sphere. It is here to be observed, that in every lens terminated in any of the forementioned manners, a right line, G H, perpendicular to the two surfaces, is called the axis of the lens; which axis, when both surfaces are spherical, passes through both their centers; but if one of them be plane, it falls perpendicularly upon that, and goes through the center of the other.

For convex lenses, the laws of their refraction, and their effects depending thereon, are as follow:

A ray of light E G (*ibid.* n° 2.) near the axis and parallel thereto, striking on the plane surface of a plano-convex lens, directly opposite to the luminous body, after refraction concurs with the axis in the point F; and if C be the center of the convexity, C F will be to C L; that is, the distance of the center from the point of concourse or focus, will be to the distance of the center from the convex surface in the ratio of the refraction.

For the plane surface being directly opposed to the luminous body, the ray E G is perpendicular to A B, and therefore will pass unrefracted to H: thus it strikes on A H B still parallel to the axis; and therefore coming out of a denser medium into a rarer, will meet the axis of the lens in F, and so as that C F will be to C L in the ratio of the sine of the refracted angle to the sine of the angle of inclination, as will be demonstrated under the article REFRACTION.

If then the refraction be out of a glass-lens into air, C F : C L : : 3 : 2, and therefore F L = 2 C L. that is, parallel rays near the axis will concur with it at the distance of the diameter. Again, if the refraction were out of a water-lens, *i. e.* out of a plano-convex lens filled with water, C F : C L : : 4 : 3, and therefore F L = 3 C L, *i. e.* parallel rays near the axis will concur with it at the distance of half the diameter. So that if a lighted candle be placed in the focus of a plano-convex lens, that is, in the point F, distant from the surface of the lens A L B, by the length of the diameter, and from the surface of the water lens by half the diameter, its rays after refraction will become parallel. See the article REFRACTION.

If the ray K I (*ibid.* n° 3.) near the axis of a plano-convex lens, and parallel thereto, strike on its convex surface A H B, after a double refraction it will meet the axis in F; so as that H G will be to G C, and G E to F H in the ratio of the refraction.

For the ray K I, parallel to the axis E G, by virtue of the first refraction in I, will tend to the point G, so as G H will be to G C in the ratio of the sine of the angle of inclination to the sine of the refracted angle: therefore by virtue of the second refraction in L, it will concur with the axis in F, so as G D will be to F D in the ratio of the sine of the refracted angle, to the sine of the angle of inclination: so that the semidiameter and thickness of the plano-convex lens, with the ratio of refraction, being given, hence arises a method of determining the focus of parallel rays striking on the convex surface. Hence, if the lens be glass, F D = 2 C H — $\frac{2}{3}$ H D. So that if two-thirds of the thickness of the lens be inconsiderable (as in practice it usually happens) parallel rays meet with the axis at the distance of the diameter from the lens, even when they strike on the convex surface.

So that as to the place of the focus, 'tis the same thing whether the plane surface or the convex one be turned to a luminary of parallel rays; though it appears both from experience and trigonometrical calculation, that there are more rays united in a less space, if the convex surface, than if the plane one be turned towards the sun. If the lens were full of water, F D = 3 C H — $\frac{3}{4}$ H D. Wherefore, if $\frac{3}{4}$ H D be inconsiderable, F D = 3 C H; or if $\frac{3}{4}$ H D be inconsiderable, F H = 3 C H. Parallel and near rays, therefore, are united at the distance of half the diameter, if the refraction be in water, even when the convex surface is opposed to the luminous body. Hence also arises a method of determining the focus of parallel rays striking on a lens convex on both sides, the two semidiameters and the thickness of the lens being given. On these principles is founded the structure of refracting burning-glasses; the sun's light and heat being exceedingly augmented in the focus of a lens, whether convex or plano-convex; since the rays falling parallel to the axis of the lens are reduced into a much narrower compass, so that 'tis no wonder they burn some bodies, melt others, and produce other extraordinary phænomena.

If a luminous body be placed in the focus behind a lens, whether plano-convex, or convex on both sides, or whether equally

equally or unequally, the rays after refraction become parallel. Hence by means of a convex lens, or a little glass bubble full of water, a very intense light may be projected to a vast distance.

And this furnishes us with the structure of a lamp or lantern, to project an intense light to an immense distance: for a lens convex on both sides, being placed opposite to a concave mirrour; if in the common focus of both be placed a lighted candle or wick, the rays reflected back from the mirrour to the lens will be parallel to each other, and after refraction will converge, till they arrive at the distance of the semi-diameter, after which they will again diverge. But the candle being likewise in the focus of the lens, the rays it throws on the lens will be parallel: and therefore a very intense light, meeting with another equally intense, at the distance of the diameter from the lens, the light will be surprizing; and tho' it afterwards decrease, yet the parallel and diverging rays going a long way together, it will be very great at a very great distance. Lanterns of this kind are of considerable service in the night-time to discover remote objects, and are used with success by fowlers and fishermen, to gather their prey together, in order to take them.

If the luminous body, placed in the focus, be of a large extent, the rays flowing from points sensibly distant from each other, cannot be parallel; but will constitute several trains, or pencils of rays, parallel to each other.

The images of objects, opposed in any manner to a convex lens, are exhibited invertedly in its focus. Hence, if a paper be applied to a convex lens (especially in a dark room) at the distance of its focus, the images of objects shining upon it will be represented distinctly, and in their natural colours, thereon: nor is the focus of the sun's rays any thing else, in effect, but the image of the sun. Hence, in solar eclipses, the sun's image, eclipsed as it is, may be burned by a large lens on a board, *&c.* a very entertaining phænomenon.

Hence also, if a convex lens of any kind be exposed both to nearer and remoter objects, and a paper at the same time applied, so as to receive the images of objects distinctly, the distance of the focus from the lens, and thence the diameter of the convexity, may be determined.

If a concave mirror be so placed, as that an inverted image formed by refraction through a lens be found between the center and the focus, or even beyond the center, it will again be inverted by reflection, and so appear erect; in the first case beyond the center, and in the latter between the center and the focus. On these principles is built the camera obscura. The diameter of the image of an object delineated beyond a convex lens, is to the object itself in the ratio of the distance of the image, to that of the object.

Since then the image of a remoter object is less distant from the lens than that of the nearer, the image of the more remote will be less than that of the nearer. And because the distance of the image from the lens is greater, if the lens be a segment of a greater sphere than of a less, the image will likewise be greater in the former case than in the latter. The image therefore will be of such a magnitude, as it would be of, were the object to shine into a dark room through a little hole upon a wall, at the same distance from the hole, at which the focus is from the lens. When an object is less distant from a lens than the focus of parallel rays, the distance of the image is greater than that of the object; otherwise the distance of the image is less than that of the object: in the former case, therefore, the image is greater than the object, in the latter less. If the images be made greater than the objects, they will not appear distinctly; because in that case there are fewer rays which meet after refraction in the same point: whence it happens, that rays proceeding from different points of an object, terminate in the same point of an image, which is the cause of confusion. Hence it appears, that the same aperture of a lens may not be admitted in every case, if we would keep off the rays which produce confusion. However, though the image is then most distinct, when no rays are admitted, but those near the axis, yet for want of rays the image is apt to be dim. If the eye be placed in the focus of a convex lens, an object viewed thro' it appears erect and enlarged, in the ratio of the distance of the object from the eye, to that of the eye from the lens, if it be near; but infinitely, if remote.

For concave lenses, their laws are as follow:

If parallel rays ſtrike on a plano-concave lens K L (*ibid.* n° 4.) and F C be to F B in the ratio of the refraction, the rays will diverge from the axis, and the point of divergency or diſperſion, called the virtual focus, will be F. For the ray H I, parallel to the axis, is perpendicular to K L, and will therefore paſs unrefracted to E. Wherefore F C being to F B in the ratio of refraction, F will be the virtual focus. See FOCUS.

If then the lens be glaſs, F B = 2 B C; *i. e.* the virtual focus F will be diſtant from the lens K L a diameter and a half 3 B C.

If the ray A E, (*ibid.* n° 5.) parallel to the axis F P, ſtrike on a lens concave on both ſides; and both F C be to F B, and I P to P H in the ratio of refraction; and F P : P H : : F B : B G; G will be the point of diſperſion, or the virtual focus. If therefore the refraction be in a glaſs-lens, the ſums of the ſemidiameters C B and H I, will be to the diameter of the concavity of either, 2 H I; as the ſemidiameter of the other, C B, to the diſtance of the virtual focus from the lens B G. Hence the ſun's rays ſtriking on a concave lens, their light after refraction will be conſiderably weakened; ſo that the effect of concave lenſes, is oppoſite to that of convex ones.

Laſtly, an object viewed thro' a concave lens appears erect, and diminiſhed in a ratio compounded of the ratios of the ſpace in the axis, between the point of incidence and the point to which an oblique ray ſhould paſs without refraction, to the ſpace of the axis between the eye and the middle of the object; and the ſpace in the ſame axis between the eye and the point of incidence, to the ſpace between the middle of the object and the point the oblique ray would paſs to without refraction.

Though the properties of lenſes have been conſidered here principally with regard to rays falling near the axis, and parallel thereto; yet the reaſoning will be eaſily transferred to rays more remote from the axis, and falling in any direction. Thus we may ſay univerſally, that in a convex lens all parallel rays become converging, and concur in a focus; that diverging rays either become leſs diverging, or run parallel, or converge; and that converging rays, converge the more: all which alterations are more ſenſible in oblique rays than in perpendicular ones, by reaſon the angles of incidence in that caſe are greater.

In concave lenſes all parallel rays become diverging; diverging rays diverge more; converging rays either converge leſs, or become parallel, or go out diverging: all which things hold of oblique, as well as direct rays, but more ſenſibly in the firſt.

A lens, one of whoſe ſurfaces is convex, and the other concave is called a *meniſcus.* Some confine lenſes within the diameter of five or ſix lines, and will have ſuch as exceed that diameter called lenticular glaſſes.

Lenſes are diſtinguiſhed with regard to their preparation, into ground and blown. Blown lenſes are little globules of glaſs melted in the flame of a lamp or taper; but the figure of theſe is ſeldom exact; beſides that the ſmoke of the lamp cleaves to the ſurface in melting: on both which accounts, they come ſhort of the clearneſs of thoſe which are ground. See the articles GRINDING and POLISHING.

For the method of determining the foci of different lenſes, ſee FOCUS.

LENS is alſo a town of the french Netherlands, eight miles north of Arras.

LENT, a ſolemn time of faſting in the chriſtian church, obſerved as a time of humiliation before Eaſter, the great feſtival of our Saviour's reſurrection.

Thoſe of the romiſh church, and ſome of the proteſtant communion, maintain, that it was always a faſt of forty days, and as ſuch, of apoſtolical inſtitution. Others think it was only of eccleſiaſtical inſtitution, and that it was variouſly obſerved in different churches, and grew by degrees from a faſt of forty hours, to a faſt of forty days. This is the ſentiment of Morton, biſhop Taylor, du Moulin, Daillee, and others.

If this faſt was of apoſtolical inſtitution, it is ſcarce accountable how ſuch a variety in point of time ſhould happen in the obſervation of it; ſome churches keeping it only three weeks, ſome ſix, ſome ſeven, and yet none of them hitting upon the preciſe number of forty days. It is obſervable however, that they all agreed in calling this faſt quadrageſimal, and aſſigned different reaſons for it; and that Aſh-wedneſday, and the other three days were not added by the romiſh church to the beginning of lent, till the ſeventh or eighth century. The manner of obſerving lent among thoſe who were piouſly diſpoſed, was to abſtain from food till evening, their only refreſhment was a ſupper, and then it

was indifferent whether it was flesh or any other food, provided it was used with sobriety and moderation.

Lent was thought the proper time for exercising, more abundantly, every species of charity. Thus what they spared from their own bodies by abridging them of a meal, was usually given to the poor: they employed their vacant hours in visiting the sick, and those that were in prison, in entertaining strangers, and reconciling differences. The imperial laws forbad all prosecution of men in criminal actions, that might bring them to corporal punishment and torture, during the whole season. This was a time of more than ordinary strictness and devotion, and therefore in many of the great churches they had religious assemblies for prayer and preaching every day. All public games and stage-plays were prohibited at this season; as also the celebration of all festivals, birth-days, and marriages, as unsuitable to the present occasion.

The christians of the greek-church observe four lents: the first commences on the fifteenth of November, or forty days before Christmas: the second is the same with our lent: the third begins the week after Whitsuntide, and continues till the festival of St. Peter and St. Paul: and the fourth commences on the first of August, and lasts no longer than till the fifteenth. These lents are observed with great strictness and austerity; but on Saturdays and Sundays they indulge themselves in drinking wine and using oil, which are prohibited on other days.

LENTISCUS, the LENTISK-TREE, in botany, belongs to the same genus with the pistachia. See PISTACHIA.

Lentisk wood is esteemed astringent and balsamic, and accordingly recommended in the fluor albus and gonorrhoea. See FLUOR ALBUS and GONORRHOEA.

LEO, the LION, in zoology. See LION.

LEO, in astronomy, one of the twelve signs of the zodiac, the fifth in order; containing, according to Ptolemy, thirty-two stars; according to Tycho, thirty-seven; and, in the britannic Catalogue, there are no less than ninety-four.

The star called the lion's heart, cor leonis, regulus, and basilicus, is a fixed star of the first magnitude.

St. LEO, a town and bishop's see of Italy, twenty miles north-west of Urbino.

LEOMINSTER, or LEMSTER. See the article LEMSTER.

LEON, the capital of the province of Leon, in Spain, situated on the river Esla: west lon. 6° 5′, north lat. 43°.

LEON is also the capital of the province of Nicaragua, in Mexico, situated at the west end of the Lake Nicaragua: west long. 91°, north lat. 11° 30′.

St. LEONARD, a town of France, in the province of Guiennes, and territory of Limosin: east long. 1° 45′, north lat. 45° 50′.

St. LEONHART, a town of Germany, in the circle of Austria, and duchy of Carinthia: east long. 15°, north lat. 47°.

LEONINE VERSES, such as rime at every hemistich, the middle syllable of each verse corresponding to the last one.

LEONTICE, in botany, a genus of the hexandria-monogynia class of plants, the flower of which consists of six oval petals; and the fruit is a large, globose, anulated and unilocular capsule, containing a few seeds of the same figure.

LEONTINI, a town of Sicily, twenty miles north-west of Syracuse.

LEONTODON, DANDELION, in botany, a genus of the syngenesia-polygamia class of plants, the compound flower of which is imbricated and uniform; and the partial ones, monopetalous and ligulated: the stamina are five scarcely discernible capillary filaments: the seed, which is solitary, is contained in the cup of each partial flower, or corollula.

Dandelion is said to have much the same virtues with endive. See ENDIVE.

LEONURUS, LION's TAIL, in botany, a genus of the didynamia gymnospermia class of plants, the flower of which is monopetalous and ringent; and its seeds, which are four in number, are contained in the bottom of the cup.

LEOPARD, a beast of prey, with the spots on the upper part of the body round, and the lower ones virgated. It is a very nimble, as well as fierce animal, so that scarce any thing escapes it.

Authors call the male pardus, and the female panthera.

LEOPARD's BANE, *doronicum*, in botany. See the article DORONICUM.

LEOPOLSTAT, a city of Upper Hungary, subject to the house of Austria: east long. 18° 6′, north lat. 48° 55′.

LEPANTO, a port-town of european Turky, eighty miles west of the isthmus of Corinth; whence the gulph of Lepanto takes its name.

LEPASTRUM, in natural history, a genus of selenitæ, composed of plates disposed in

in the form of a radiated ftar. See the article SELENITÆ.

LEPIDIUM, DITTANDER, in botany, a genus of the tetradynamia-filiculofa clafs of plants, with a tetrapetalous cruciform flower: the ftamina are fix fubulated filaments; and the fruit is a compreffed bilocular pod.

LEPIDOPTERA, in zoology, an order of infects, with four wings, which are covered with imbricated fquamulæ: add to this, that the mouth is commonly fpiral.

Under this order are comprehended the butterflies, and phalenæ, or moths.

LEPIUM, in natural hiftory, a genus of foffils of the harder gypfum, compofed of very fmall particles, and of a lefs glittering hue. See the article GYPSUM.

There is only one fpecies of this genus, being one of the leaft valuable and moft impure of the clafs of gypfums. It is of an extremely rude, irregular, coarfe and unequal ftructure; a little foft to the touch, of a very dull appearance, and of different degrees of a greyifh white. It is burnt in plaifter for the coarfer works; it calcines very flowly and unequally, and makes but a very coarfe and ordinary plaifter.

LEPROSO AMOVENDO, an antient writ for removing a perfon infected with the leprofy, who forced himfelf into the company of his neighbours, either in a church, or at fome public meeting.

LEPROSY, *lepra*, a foul cutaneous difeafe, appearing in dry, white, thin, fcurfy fcabs, either on the whole body, or only fome part of it, and ufually attended with a violent itching and other pains.

The leprofy is faid to be of two kinds, that of the Arabians, called elephantiafis, from the roughnefs, inequalities, and tubercles of the fkin, refembling that of an elephant; and that of the Greeks, called impetigo. See ELEPHANTIASIS.

Lucretius fuppofed the elephantiafis to be generated in Egypt, and no where elfe; but if the leprofy of the jews is the fame as that of the negroes, which is highly probable; then it may be affirmed, that it is endemical to the fouthern and inland parts of Africa. That it was contagious all hiftories facred and prophane agree. Pliny acquaints us, that it did not invade Italy till the time of Pompey the Great, and that it was brought from Egypt, and is peculiar to that kingdom. Some have thought that the leprofy of the Arabians, or more properly of the Africans, was the parent of the lues venerea; however that be, it is certain, that fince the pox has been curable, the elephantiafis feems to have difappeared, and the leprofy of the Greeks has been much lefs frequent than before.

Pliny informs us, that the firft appearance of the elephantiafis is in the face, particularly a fmall fpeck appears on the nofe or noftril, and as the difeafe increafes, the whole body is full of fpots of various colours; the fkin is thick in one place, and thin in another; hard and rough with fcabs. In procefs of time, the fkin turns black, and eats away the flefh to the very bones; then the body, Celfus obferves, falls away, the mouth legs and feet fwell, and the fingers and toes are hid with a fwelling; even the bones themfelves do not efcape: afterwards a fever arifes, to which the patient falls an eafy victim.

This leprofy has made great progrefs of late years in Barbadoes, not only among the negroes, but the white inhabitants. Towne fays, that at firft there appears fpots of a brown copper-colour, difperfed over feveral parts of the face, but efpecially on the nofe, without any uneafinefs or fenfe of pain at the beginning: thefe fpread by flow degrees, till a great part of the body is covered with them.

There is another difeafe which Towne falfely calls the elephantiafis, which generally happens after long illnefs, acute fevers, obftinate intermittents, or other tedious diftempers: the vitiated humours generally fubfiding into one leg, fometimes into both, imitating an anafarca. As the leg becomes more tumified, the veins are diftended with various fwellings from the knee to the toes: then the fkin begins to grow rugged and unequal, its vafcular and glandular compages are enlarged, and a fcaly fubftance with a fort of chaps and fiffures in the interftices appear on the furface: thefe feeming fcales do not dry up, but are protruded forward, and ftretched in their dimenfion till the leg is enlarged to an enormous bulk.

Hoffman thinks the feat of thefe difeafes is in the fkin, but chiefly the fatty membrane thereof, where the fomes of the impure and corrupt matter chiefly refides; infomuch that by corroding, pricking, and inflaming the nervous fibrillæ of the fkin, various kinds of puftles are generated.

This

This disease is hereditary and infectious; for it may be caught by the saliva of a leper, if a sound person drinks after him, by touch, by lying in the same bed, and by coition.

An inveterate leprosy was judged to be absolutely incurable; but Aretæus says, when the disease is new and recent, there are great hopes of a cure. What he and Celsus prescribe in order to the cure is not worth repeating; for if any medicines will do, they must be of the herculean kind. Authors are excessive in the praise of viper's flesh, which Hoffman judges to be quite insignificant. Joel advises bleeding, and purging with twelve grains of the extract of black hellebore, or three grains of the glass of antimony, in conserve of roses: but the vitrum ceratum is more safe, and may be given in a larger dose. Towne confesses, that the antimonial preparations yielded most relief in Barbadoes, but he could not say that they perfected the cure. On the other hand, mercury exasperated the distemper, irritated the ulcers, and made them spread the faster.

The impetigo or leprosy of the Greeks, begins with red pimples or pustles breaking out in various parts of the body; sometimes they appear single, sometimes a great number arise together, especially on the arms and legs. As the disease increases, fresh pimples arise, which joining the former, make a sort of cluster, all which enlarge their borders, and spread in an orbicular form. This leprosy, according to Turner, breaks out first in the elbows and knees, but soon spreads farther, and gradually shews itself over all the body. The causes and seat of this disease are said to be the same as the former. Willis blames all dried and salted meats, especially hog's flesh, and fish, particularly shell-fish; because the poor people in Cornwal inhabiting near the sea-coast, were formerly much subject to leprous diseases, and had many hospitals erected on that account.

In the method of cure, says Hoffman, we should endeavour to discharge out of the body the mass of corrupt glutinous and acrid humours, by sufficient bleeding, and abstinence, by purges, as well gentle as drastic, then by proper aliment, and a good regimen, promote the generation of wholesome juices; and likewise by external, detersive, consolidating and drying remedies, to free the part from pain, tumours, itching, and ulcers. The purges may consist of the root and the resin of jalap, the extract of black hellebore, elaterium mixt with calomel, or ethiops mineral, and gum ammoniac. Among those things which stimulate the parts to an excretory motion, and more powerfully melt down the tenacious humours, the wood and bark of guaiacum exceed all others: the most considerable besides these, are the tartarized and acrid tincture of antimony, sulphur of antimony, cinnabar, and if a venereal taint is suspected, a decoction of crude antimony; which medicines in a convenient dose in the morning, with purifying decoctions drank in bed, afford great relief. But if these fail, recourse must be had to mercury, which some, after extinction, mix with flowers of sulphur and camphire, and rub it on the joints to promote a salivation. Others more properly give mercurius dulcis, with double the quantity of crab's-eyes, and calx of antimony, rising gradually from three or four grains, to a scruple, in order to salivate with proper precautions. See SALIVATION.

LEPTODECORHOMBES, in natural history, a genus of fossils of the order of the selenitæ; consisting of ten planes, each so nearly equal to that opposite to it as very much to approach to a decahedral parallelopiped, though never truly or regularly so. Two of the planes in this genus, which may properly enough be called the top and bottom are ever broader and flatter than the rest, and these, tho' not regularly equal, usually answer one another very nearly, as also do the other eight in two sets of fours. There are four shorter planes meeting in somewhat acute angles, two and two, from the ends, or two shorter edges of the two flat and broad rhomboidal planes, called the top and bottom; and four longer meeting in more obtuse angles from the sides, or longer edges of the same rhomboidal planes. As the broader and flatter planes, or the top and bottom, in this genus are not regularly equal to each other, so neither are the eight narrower to their opposites, but there are usually differences both in their angles, and in the breadth of them. See the article SELENITÆ.

Of this genus there are only five known species. 1. A thin, fine, pellucid, and slender streaked one, with transverse striæ, found in considerable quantities in the strata of clay in most parts of England, particularly near Heddington in Oxfordshire.

ſhire. 2. A thin, dull-looking, opake, and ſlender ſtreaked one, more ſcarce than the former, and found principally in Leiceſterſhire and Staffordſhire. 3. A thin fine ſtreaked one, with longitudinal ſtriæ, found in the clay-pits at Richmond, and generally lying at great depths. This has often on its top and bottom a very elegant ſmaller rhomboide, deſcribed by four regular lines. 4. A rough kind with thick tranſverſe ſtriæ, and a ſcabrous ſurface, very common in Leiceſterſhire and Yorkſhire. And, 5. a very ſhort kind, with thick plates, common in the clay-pits of Northamptonſhire and Yorkſhire.

LEPTOPOLYGINGLIMI, in natural hiſtory, a name which Dr. Hill gives to a genus of foſſil-ſhells, diſtinguiſhed by a number of minute teeth at the cardo; whereof we find great numbers at Harwich cliff, and in the marle-pits of Suſſex.

LEPTURA, in zoology, a genus of winged inſects, the antennæ whereof are oblong, ſlender and ſetaceous, the exterior wings are truncated at their extremity, and the thorax is of a ſubcylindric figure. See the article INSECTS.

LEPUS, the HARE, in zoology. See HARE.

LEPUS, in aſtronomy, a conſtellation of the ſouthern hemiſphere; comprehending 12 ſtars, according to Ptolemy; 13, according to Tycho; and 19, in the Britannic Catalogue.

LERIA, a city and biſhop's ſee of Portugal: weſt longitude 9° 15′, and north latitude 39° 30′.

LERIDA, a city and biſhop's ſee of Catalonia, in Spain: eaſt longitude 5′, north latitude 41° 20′.

LERINS, two iſlands on the coaſt of Provence, five or ſix miles ſouth of Antibes, called St. Margaret and St. Honorat.

LERNEA, the SEA-HARE, in zoology, a ſea-inſect of the order of the gymnarthria, the body of which is of an oblong cylindric figure, and is perforated in the forehead; the tentacula reſemble ears. See the article GYMNARTHRIA.

LE ROY LE VEUT, the king's aſſent to public bills. See the articles BILL, STATUTE, and PARLIAMENT.

LESBOS, or METELIN, an iſland of the Archipelago, ſixty miles north-weſt of Smyrna. Its chief town is Caſtro.

LESCAR, a city and biſhop's ſee of France, forty miles eaſt of Bayonne.

LESKARD, a borough-town of Cornwal, fifteen miles weſt of Launceſton, which ſends two members to parliament.

LESSINES, a town of the Auſtrian Netherlands, fourteen miles north of Mons.

LESSONS, among eccleſiaſtical writers, portions of the holy ſcriptures, read in chriſtian churches, at the time of divine ſervice.

In the antient church, reading the ſcriptures was one part of the ſervice of the catechumens, at which all perſons were allowed to be preſent, in order to obtain inſtruction.

The church of England, in the choice of leſſons, proceeds as follows: for the firſt leſſon on ordinary days, ſhe directs, to begin at the beginning of the year with Geneſis, and ſo continue on, till the books of the Old Teſtament are read over, only omitting the Chronicles, which are for the moſt part the ſame with the books of Samuel and Kings, and other particular chapters in other books, either becauſe they contain names of perſons, places, or other matters leſs profitable to ordinary readers.

The courſe of the firſt leſſons for Sundays is regulated after a different manner. From Advent to Septuageſima-Sunday, ſome particular chapters of Iſaiah are appointed to be read, becauſe that book contains the cleareſt prophecies concerning Chriſt. Upon Septuageſima-Sunday Geneſis is begun, becauſe that book which treats of the fall of man, and the ſevere judgment of God inflicted on the world for ſin, beſt ſuits with a time of repentance and mortification. After Geneſis, follow chapters out of the books of the Old Teſtament, as they lie in order; only on feſtival Sundays, ſuch as Eaſter, Whitſunday, &c. the particular hiſtory relating to that day is appointed to be read; and on the Saints-days, the church appoints leſſons out of the moral books, ſuch as Proverbs, Eccleſiaſtes, Eccleſiaſticus, &c. as containing excellent inſtructions for the conduct of life.

As to the ſecond leſſons, the church obſerves the ſame courſe both on Sundays and week days: reading the goſpels and Acts of the Apoſtles in the morning, and the epiſtles in the evening, in the order they ſtand in the New Teſtament: excepting on ſaints-days and holy-days, when ſuch leſſons are appointed, as either explain the myſtery, relate the hiſtory, or apply the example to us.

LESSOR, and LESSEE, in law. See LEASE.

LESTWITHIEL, a borough-town of

Cornwal, twenty-three miles south-west of Launceston, which sends two members to parliament.

LET FALL, a word of command at sea, to put out a sail when the yard is aloft, and the sail is to come or fall down from the yard; but, in strictness, is only applied to the main and fore-courses, when their yards are hoisted up.

LETHARGY, in medicine, a disease wherein such a profound drowsiness or sleepiness attends the patient, that he can be scarce awaked, and, if awaked he remains stupid, without sense or memory, and presently sinks again into his former sleep. The lethargy has some affinity to the apoplexy and palsy, and often attends them. In these sleepy disorders, there is sometimes a fever, and sometimes none. The immediate cause of them is a very languid and diminished influx of the animal spirits from the cortical part of the brain into the medulla oblongata, and from thence into the nerves destined for sense and motion. See the article APOPLEXY.

There are several kinds of these disorders, but the principal are a coma vigil, a coma somnolentum, a carus, and a lethargy. See COMA VIGIL, COMA SOMNOLENTUM, and CARUS.

A lethargy then, properly so called, is attended with a fever, which is a symptom thereof, and is chiefly discovered by the frequency of the pulse, whereas a carus is often a symptom or consequence of a fever. It does not invade so suddenly as an apoplexy. It is never without danger, but that is the worst which is attended with a tremor of the limbs, and a cold sweat of the face.

The causes of a lethargy are the same as of a coma somnolentum, but more violent. The cause proceeds from an obstruction of the passage of the nervous fluid, from the cortical part to the medulla oblongata, as was already observed: such is, 1. Too great a relaxation of the blood-vessels in the brain, which retards the circulation, and happens to plethoric old men. 2. A difficult circulation of the blood through the head, especially when thick and impure: hence plethoric, scorbutic and hypochondriac persons, are frequently drowsy, especially when there are spasms in the abdomen: hence children troubled with worms are sleepy, because the blood is forced too plentifully to the head: hence the profound sleep of plethoric persons, when intoxicated, may be accounted for, which when caused by excess of spirituous liquors is often fatal. 3. An excessive collection of serum in the brain, and its membranes, and an extravasation thereof; the suppression of the running of the ears, a coryza and ulcers will cause a lethargy, or coma somnolentum, and either of them immediately follows a suppression of urine.

Among the remote causes of these diseases may be reckoned a cacochymic, cachectic, and scorbutic habit of body; a debility from grief, tedious diseases, great loss of blood, abuse of intoxicating liquors, frequent surfeits, breathing a dense vapid air, a moist cloudy season, westerly winds, the winter-season, and an abuse of tobacco: likewise a suppression of the hæmorrhoids, menses, or any usual hæmorrhage, or any customary evacuation, too long an absence of the gout, and the like, will occasion these disorders.

In the cure of these diseases, says Hoffman, three intentions should chiefly be regarded: 1. To raise the patient from sleep. 2. To remove the difficulty of circulation, and the stagnation or extravasation of the blood or serum in the head. 3. To restore the strength of the membranes and vessels of the brain. Those remedies are efficacious, in the first case, which act on the nervous parts, by inducing a tremulous and oscillatory motion through the whole nervous system; such as powerful acids mixed with tincture of castor, &c. volatile salts, fetid things, as galbanum, burnt partridges feathers, cold water thrown on the head, cataplasms made with vinegar, rue, bay-leaves, tops of savory, mustard-seed, castor, and camphire, applied to the head, forehead, and temples. The serous colluvies is derived from the head by sternutatories; the best is ten grains of salt of white vitriol, dissolved in half an ounce of marjoram-water, and drawn up the nose; blisters on the feet and neck; cupping-glasses, either with or without scarification; strong frictions on the lower parts; stimulating clysters, with the addition of sal gem, common salt, or the root of squills. To remove the stagnation, and promote the circulation, if the vessels are turgid with blood, venesection is necessary; then gentle laxatives and nervous medicines mixed with diaphoretics. A powder made of salt of hartshorn, salt of amber, cinnabar of antimony, and bezoar-mineral, has very great and salutary effects.

But to be more particular: the cure of the coma vigil we have given under that head, as alfo that of the coma fomnolentum; only it may be farther obferved, that a coma vigil, which accompanies a hemiplegia, is of longer continuance; and that its cure depends on curing the principal diforder. In the coma fomnolentum, a red face, turgid with blood, indicates bleeding. Volatile fpirits or falts fhould never be applied to the nofe; but when fleepinefs proceeds from a cold ferous caufe, or when an eryfipelas, miliary, or other eruptive matter is tranflated to the brain, here penetrating acids are ufeful. Sternutatories fhould not be ufed in the beginning of the diforder, if the perfon is plethoric, becaufe they occafion a great afflux of humours to the head, whereby an apoplexy may be occafioned. A carus, efpecially the firft fpecies of it, requires plentiful bleeding, and the patient muft be roufed by clyfters rendered ftimulating with powder of fquills; by blifters, by putting diftilled vinegar into the noftrils, and by appeafing the orgafm of the fluids, with cooling fixed diaphoretics and acids: the fecond fpecies requires but little or no affiftance: and the third is incurable, efpecially if blifters fail.

LETHE, in the antient mythology, one of the rivers of hell, fignifying oblivion or forgetfulnefs; its waters having, according to poetical fiction, the peculiar quality of making thofe who drank of them entirely forget every thing that was paft.

LETRIM, or Leitrim, a county of Ireland, in the province of Connaught; bounded by Fermanagh on the north, by Cavan on the eaft, by Rofcommon on the fouth, and by Sligo on the weft.

LETTER, a character ufed to exprefs one of the fimple founds of the voice; and as the different fimple founds are expreffed by different letters, thefe, by being differently compounded, become the vifible figns or characters of all the modulations and mixtures of founds ufed to exprefs our ideas in a regular language. Thus, as by the help of fpeech we render our ideas audible; by the affiftance of letters we render them vifible, and by their help we can wrap up our thoughts, and fend them to the moft diftant parts of the earth, and read the tranfactions of different ages. As to the firft letters, what they were, who firft invented them, and among what people they were firft in ufe, there is ftill room to doubt: Philo attributes this great and noble invention to Abraham; Jofephus, St. Irenæus, and others, to Enoch; Bibliander, to Adam; Eufebius, Clemens Alexandrinus, Cornelius Agrippa, and others, to Mofes; Pomponius Mela, Herodian, Rufus Feftus, Pliny, Lucan, &c. to the Phœnicians; St. Cyprian, to Saturn; Tacitus, to the Egyptians; fome, to the Ethiopians; and others, to the Chinefe: but, with refpect to thefe laft, they can never be entitled to this honour, fince all their characters are the figns of words, formed without the ufe of letters; which renders it impoffible to read and write their language, without a vaft expence of time and trouble; and abfolutely impoffible to print it by the help of types, or any other manner by the engraving, or cutting in wood. See the article Printing.

There have alfo been various conjectures about the different kinds of letters ufed in different languages; thus, according to Crinitus, Mofes invented the hebrew letters; Abraham, the fyriac and Chaldee; the Phœnicians, thofe of Attica, brought into Greece by Cadmus, and from thence into Italy, by the Pelafgians; Nicoftrata, the roman; Ifis, the egyptian; and Vulfilas, thofe of the Goths.

It is probable that the egyptian hieroglyphics were the firft manner of writing: but whether Cadmus and the Phœnicians learned the ufe of letters from the Egyptians, or from their neighbours of Judea or Samaria, is a queftion; for fince fome of the books of the Old Teftament were then written, they are more likely to have given them the hint, than the hieroglyphics of Egypt. But wherefoever the Phœnicians learned this art, it is generally agreed, that Cadmus, the fon of Agenor, firft brought letters into Greece; whence, in following ages, they fpread over the reft of Europe.

Letters make the firft part or elements of grammar; an affemblage of thefe compofe fyllables and words, and thefe compofe fentences. The alphabet of every language confifts of a number of letters, which ought each to have a different found, figure, and ufe. As the difference of articulate founds was intended to exprefs the different ideas of the mind, fo one letter was originally intended to fignify only one found, and not, as at prefent, to exprefs fometimes one found and fometimes another; which practice has brought a great deal of confufion into the languages,

guages,

guages, and rendered the learning of the modern tongues much more difficult than it would otherwife have been. This confideration, together with the deficiency of all the known alphabets, from their wanting fome letters to exprefs certain founds, has occafioned feveral attempts towards an univerfal alphabet, to contain an enumeration of all fuch fingle founds or letters, as are ufed in any language. See the article ALPHABET.

Grammarians diftinguifh letters into vowels, confonants, mutes, liquids, diphthongs, and characteriftics. They are alfo divided into labial, dental, guttural, and palatal, and into capital and fmall letters. They are alfo denominated from the fhape and turn of the letters; and in writing are diftinguifhed into different hands, as round-text, german-text, round hand, italian, &c. and in printing, into roman, *italic*, and black letter. The term letter, or type, among printers, not only includes the CAPITALS, SMALL CAPITALS, and fmall letters, but all the points, figures, and other marks, caft and ufed in printing; and alfo the large ornamental letters, cut in wood or metal, which take place of the illumined letters ufed in manufcripts. The letters ufed in printing are caft at the ends of fmall pieces of metal, about three quarters of an inch in length; and the letter being not indented, but raifed, eafily give the impreffion, when, after being blacked with a glutinous ink, paper is clofely preffed upon it. See the article TYPE.

A fount of letters includes fmall letters, capitals, fmall capitals, points, figures, fpaces, &c. but befides thefe they have different kinds of two-lined letters, only ufed for titles, and the beginning of books, chapters, &c. See the article FOUNT.

LETTER *of attorney*, in law, is a writing by which one perfon authorifes another to do fome lawful act in his ftead, as to give feifin of lands, to receive debts, fue a third perfon, &c.

The nature of this inftrument is to transfer to the perfon to whom it is given, the whole power of the maker, to enable him to accomplifh the act intended to be performed. It is either general, or fpecial; and fometimes it is made revocable, which is when a bare authority is only given; and fometimes it is irrevocable, as where debts, &c. are affigned from one perfon to another. It is generally held, that the power granted to the attorney muft be ftrictly purfued; and that where it is made to three perfons, two cannot execute it. In moft cafes, the power given by a letter of attorney determines upon the death of the perfon who gave it. No letter of attorney made by any feaman, &c. in any fhip of war, or having letters of marque, or by their executors, &c. in order to impower any perfon to receive any fhare of prizes, or bounty-money, fhall be valid, unlefs the fame be made revocable, and for the ufe of fuch feamen, and be figned and executed before, and attefted by, the captain and one other of the figning officers of the fhip, or the mayor or chief magiftrate of fome corporation.

LETTERS-CLAUSE, or CLOSE LETTERS, are oppofed to letters-patent, becaufe they are commonly fealed up with the king's fignet or privy-feal, while letters-patent are left open.

LETTERS *of credit*, among merchants, is a letter wrote by a merchant or banker, to his correfpondent abroad, requefting him to credit the bearer as far as a certain fum. See the article CREDIT.

LETTER *of licence*, an inftrument or writing granted by a perfon's creditors, allowing him a certain time for the payment of his debts; by which means he is enabled to profecute his bufinefs, without fearing an arreft.

LETTER *of mart*, or *marque*, a letter granted to one of the king's fubjects, under the privy feal, impowering him to make reprifals for what was formerly taken from him by the fubjects of another ftate, contrary to the law of mart. See the article MARQUE.

Monitory LETTERS. See MONITORY.

LETTERS-PATENT, or OVERT, are writings fealed with the great feal of England, fo called, becaufe they are open with the feal affixed to them. Thefe are granted to authorife a man, to do, or enjoy, what of himfelf he could not do. See the article PATENT.

Pacific LETTERS, *literæ pacificæ*, in church-hiftory, teftimonial letters given by the bifhop, or chorepifcopus, to their priefts, when they had occafion to travel abroad, certifying that the bearer was a catholic, and in communion with the church.

Pafchal LETTER, a letter written by the pope to all metropolitans, to inform them on what day eafter was to be celebrated.

LETTERE, a town of Italy, in the kingdom of Naples and hither Principate, fituated on the gulph of Naples: eaft longi-

longitude 15°, and north lat. 40° 45′.

LETTUCE, *lactuca*, in botany, a genus of the syngenesia-polygamia-æqualis class of plants, the compound flower of which is imbricated and uniform, with numbers of equal hermaphrodite-corollulæ shorter than the cup; the partial corolla is monopetalous, ligulated, truncated, and quadri or quinquedentated; it has no pericarpium; the cup is connivent and ovato-cylindric; the seed is single, ovated, acuminated and compressed. The common lettuce is generally sown for cutting very young, to mix with other salad herbs in spring; the cabbage lettuce is only this mended by culture: it may be sown at all times of the year; but in the hot months requires to be sown in shady borders. The cabbage-lettuce may also be sown at different seasons, to have a continuation of it through the summer. The first crop should be sown in February, in an open situation; the others, at three weeks distance, and the latter ones under covert, but not under the dripping of trees. The silesia, imperial, royal, black, white and upright cos-lettuces, may be sown first in the latter end of February or the beginning of March, on a warm light soil, and in an open situation: when the plants are come up, they must be thinned to fifteen inches distance every way; they will then require no farther care, than the keeping them clear of weeds; and the black cos, as it grows large, should have its leaves tied together, to whiten the inner part. Succeeding crops of these should be sown in April, May, and June, and towards the latter end of August they may be sown for a winter crop, to be preserved under glasses, or in a bed arched over with hoops and covered with mats.

The most valuable of all the English lettuces, are the white cos, or the Versailles, the Silesia, and the black cos. The brown Dutch and the green capuchin are very hardy, and may be sown late, under walls, where they will stand the winter, and be valuable, when no others are to be had. The red capuchin Roman and prince-lettuces, are very early kinds, and are sown for variety, as are also the Aleppo-ones for the beauty of their spotted leaves.

The milk of the common garden-lettuces is hypnotic, while the root of the plant is cooling, diluent and nourishing.

LEVANT, a name given to the east part of the Mediterranean sea, bounded by Natolia or the lesser Asia on the north, by Syria and Palestine on the east, by Egypt and Barca on the south, and by the island of Candia and the other part of the Mediterranean on the west.

LEVARI FACIAS, is a writ directed to the sheriff for levying a certain sum of money upon the lands, &c. of a person who has forfeited his recognizance. There is also a levari facias damna de disseisitoribus, which is for the levying of damages wherein the disseisor has been before condemned to the disseisee. There is likewise a levari facias residuum debiti, to levy the remainder of a debt, upon the lands, tenements, &c. of the debtor, when part has been satisfied.

LEVATOR, in anatomy, a name given to several muscles: as, 1. To two muscles of the anus; these arise on each side with a broad base, from the internal part of the os pubis, the tunic of the obturator internus, the internal part of the os ileum: and the acute process of the ischium: from these proceed fibres, in the manner of rays, running from a circumference to a center, directing their course toward the sphincter; and finally they unite in the hinder part of the intestine, which they surround, including at the same time the neck of the urinary bladder; the prostatæ and the seminal vessels in men, and in women the vagina: they are, after this, inserted partly in the upper and hinder part of the sphincter, and partly confound and blend their fibres with those of the oval and annular kind, which form the sphincter; and from this course of their fibres it is evident, that they may serve not only for sustaining and elevating the anus, but to press the vesiculæ seminales and prostatæ in the coitus. 2. Beside these, there are, according to Dr. Douglas, a pair of smaller levatores, which arise partly tendinous and partly fleshy, from the protuberance of the ischium; and are thence carried transversely toward the anus, and are inserted into its sphincter, near the bulb of the urethra. 3. The levatores costarum of Steno, and supra costales of Verheyen, which contribute to respiration, are of two kinds, distinguished, from their figure, into short and long: the short ones are twelve on each side; they have their origin from the transverse processes of eleven vertebræ of the back and of the lower one of the neck, and they are inserted obliquely into the hinder part of the ribs: the long ones

are

are three or four; their origin is the fame from the feventh, eighth, ninth, tenth, eleventh, and twelfth ribs.

LEUCADENDRON, in botany, a genus of the tetrandria-monogynia clafs of plants, the general corolla of which is uniform and convex; the partial one is oblong, hoary on the outfide, and compofed of two petals; the upper petal is a long line or unguis, and its limb is lanceolated, undivided, and in its lower part is firmly joined to the lower petal; the lower petal has alfo a long unguis of a linear figure, but three times as broad as that of the upper petal; the cup, fcarce at all altered, ferves inftead of a pericarpium, and contains a fingle roundifh feed, coronated with hairs.

LEUCATE, a town of Languedoc, in France, fourteen miles fouth of Narbonne.

LEUCHTENBERG, a town of Germany, fifteen miles north-eaft of Amberg.

LEUCOIUM, the GREAT SNOW-DROP, in botany, a genus of the hexandria-monogynia clafs of plants, the corolla of which is of a rounded fhape, patent, and divided into fix plane oval petals, almoft from the very bafe, and their tops fomewhat thicker and narrower than their middles; their fruit is a turbinated capfule, formed of three valves, and containing three cells; the feeds are numerous and roundifh. This is alfo the name whereby Tournefort calls the cheiranthus of Linnæus. See CHEIRANTHUS.

LEUCOMA, in furgery, a diftemper of the eye, otherwife called albugo. See the article ALBUGO.

The caufes of thefe blemifhes or fpots on the eye are various: they may arife, 1. from an obftruction of the pellucid veffels in the tunica cornea, and an infpiffation of their contained juices, proceeding from a violent inflammation of the eye: or, 2. from a fuppuration, and then an induration of thefe juices in the cornea after an inflammation, fo that by degrees it becomes more opaque, as it hardens, and puts on a whitifh hue, being fomtimes miftaken for an unguis. 3. Thefe fpots may arife from an external erofion or ulcer in the cornea. Or, 4. from puftules or veficulæ in various inflammatory diforders, particularly from thofe which are occafioned by the fmall pox. 5. They may proceed from the fcars after a puncture in the cornea from a fword, knife, or fork. Or, 6. from a burn, or the corroding acrimony of cauftic fubftances falling into the eye, tho' they may fometimes be formed of a peculiar tunic growing to the eye itfelf.

Thefe diforders of the cornea are fome more and fome lefs difficult to remove, according to their duration, and the particular caufes from whence they proceed, with the patient's age and other circumftances. Infants may be more eafily freed from them than adults, when they are not of any long ftanding; but for thofe which are fcars formed from wounds, burns, punctures, or the like, there is little or no hope of removing them. Heifter directs, that thefe fpots which arife from infpiffated humours, and are not of long ftanding, be removed by a proper regimen, attenuating diet and medicines, efpecially a plentiful ufe of the decoctions and infufions which are fudorific; but then, at the fame time, there muft be ufed externally phlebotomy, fcarification, bliflers, and frequent wafhing of the feet, and upon the eye itfelf may be applied difcutient bags. In thofe fpots which proceed from abfceffes, or a fuppuration of matter after an inflammation betwixt the laminæ of the cornea, which they elevate like a pea, an incifion ought to be made into the cornea, to difcharge the included matter; the incifion for this purpofe muft be made with a lancet, or couching needle, treating the eye afterwards with difcutient medicines: but when the cornea is eroded, the following method is taken by Mr. St Yves; firft he removes the inflammation, and then orders the patient to wafh his eye frequently with the aqua viridis ophthalmica Hartmanni, which is made weaker or ftronger, according as the patient can bear it. In puftules arifing from the fmall pox, there fhould be an apertion made by a needle or lancet, immediately to difcharge the eroding matter, removing the pellicle afterwards with fome burnt alum, candy-fugar, and the fhells of eggs, made into powder, and applied every day to the cornea.

LEUCOPHLEGMATIA, in medicine, a kind of dropfy, otherwife called anafarca. See ANASARCA and DROPSY.

LEUE, a town of the auftrian Netherlands, fixteen miles eaft of Louvain.

LEVEL, an inftrument wherewith to draw a line parallel to the horizon, by means of which the true level, or the difference of afcent or defcent between feveral places, may be found for conveying water, draining fens, *&c.*

There are feveral inftruments of different contrivance and matter, invented for the perfection

perfection of levelling, all of which, for the practice, may be reduced to those that follow.

Air-LEVEL, that which shews the line of level by means of a bubble or air inclosed with some liquor in a glass-tube of an indeterminate length and thickness, whose two ends are hermetically sealed. When the bubble fixes itself at a certain mark, made exactly in the middle of the tube, the plane or ruler wherein it is fixed is level. When it is not level, the bubble will rise to one end. This glass-tube may be set in another of brass, having an aperture in the middle, whence the bubble of air may be observed. The liquor wherewith the tube is filled, is oil of tartar, or aqua secunda; those not being liable to freeze as common water, nor to rarefaction and condensation, as spirit of wine is. There is one of these instruments with sights, being an improvement upon that last described, which, by the addition of more apparatus, becomes more commodious and exact. It consists of an air-level, see plate CLVI. n° 1. about eight inches long, and seven or eight lines in diameter, set in a brass-tube, 2. with an aperture in the middle, C. The tubes are carried in a strong straight ruler, a foot long, at whose ends are fixed two sights, 3, 3, exactly perpendicular to the tubes, and of an equal height, having a square hole, formed by two fillets of brass crossing each other at right angles, in the middle whereof is drilled a very little hole, through which a point on a level with the instrument is descried. The brass-tube is fastened on the ruler by means of two screws, one whereof, marked 4, serves to raise or depress the tube at pleasure, for bringing it towards a level. The top of the ball and socket is rivetted to a little ruler that springs, one end whereof is fastened with screws to the great ruler, and at the other end has a screw, 5, serving to raise and depress the instrument when nearly level.

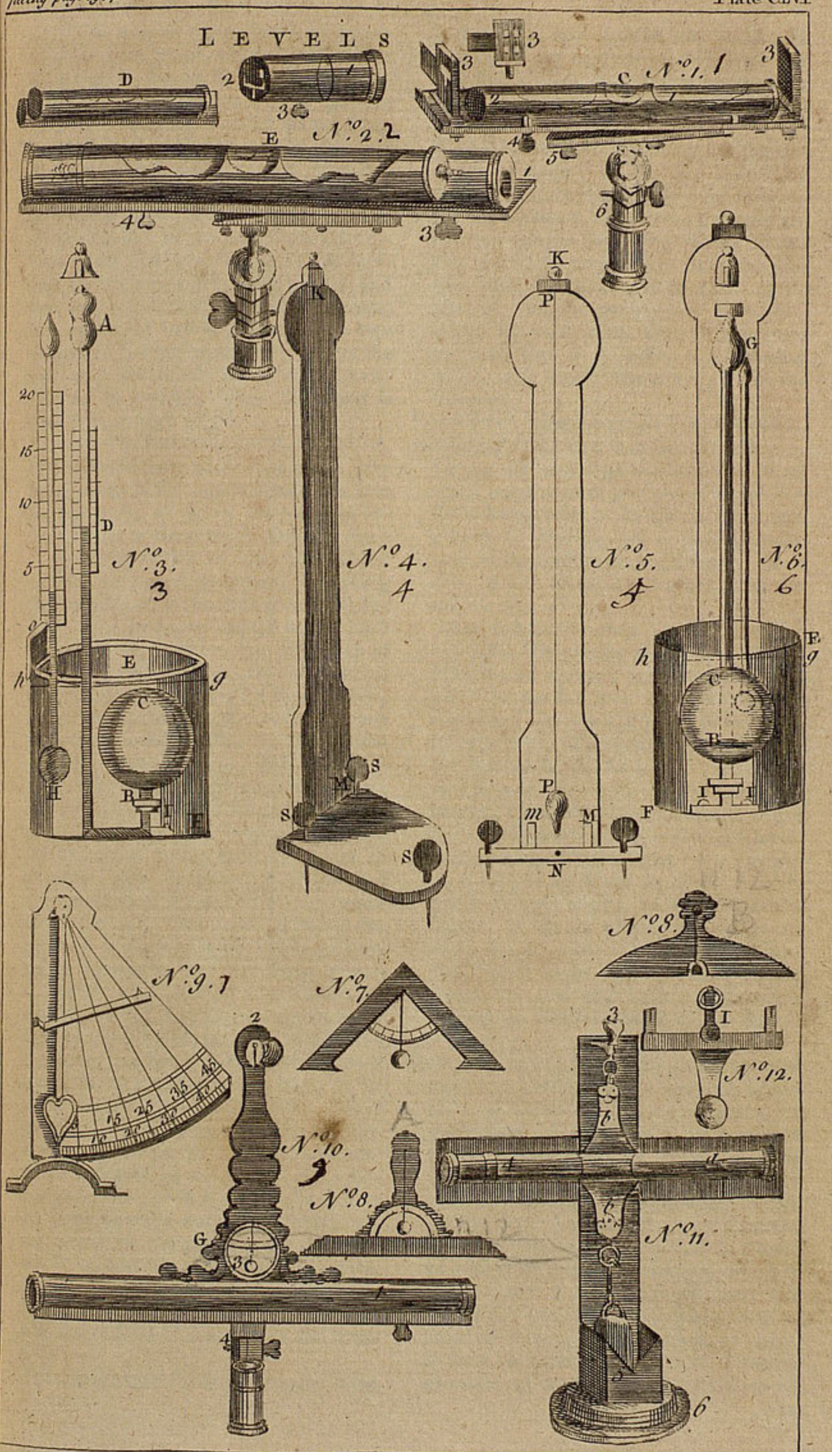
This instrument, however, is yet less commodious than the following one, because though the holes be ever so small, yet they will still take in too great a space to determine the point of level precisely.

This instrument consists of an air level, with telescope-sights: this level (*ibid.* n° 2.) is like the last, with this difference, that instead of plane sights, it carries a telescope to determine exactly a point of level at a good distance. The telescope is a little brass-tube, about fifteen inches long fastened on the same ruler as the level. At the end of the tube of the telescope, marked 1. enters the little tube, 1, carrying the eye-glass and an hair horizontally placed in the focus of the object-glass, 2. which little tube may be drawn out, or pushed into the great one, for adjusting the telescope to different sights: at the other end of the telescope is placed the object-glass. The screw 3, is for raising or lowering the little fork, for carrying the hair, and making it agree with the bubble of air, when the instrument is level; and the screw 4, is for making the bubble of air, D or E, agree with the telescope: the whole is fitted to a ball and socket. M. Huygens is said to be the first inventor of this level, which has this advantage, that it may be inverted by turning the ruler and telescope half round; and if then the hair cut the same point that it did before, the operation is just.

It may be observed, that one may add a telescope to any kind of level, by applying it upon or parallel to the base or ruler, when there is occasion to take the level of remote objects.

Dr. Desaguliers contrived an instrument, by which the difference of level of two places, which could not be taken in less than four or five days with the best telescope-levels, may be taken in as few hours. The instrument is as follows: to the ball C (*ibid.* n° 3.) is joined a recurve tube B A, with a very fine bore, and a small bubble at top, A, whose upper part is open. It is evident from the make of this instrument, that if it be inclined in carrying, no prejudice will be done to the liquor, which will always be right both in the ball and tube, when the instrument is set upright. If the air at C, be so expanded with heat, as to drive the liquor to the top of the tube, the cavity A, will receive the liquor, which will come down again and settle at D, or near it, according to the level of the place where the instrument is, as soon as the air at C, returns to the same temperament as to heat and cold. To preserve the same degree of heat, when the different observations are made, the machine is fixed in a tin vessel E F, filled with water up to *g h*, above the ball, and a very sensible thermometer has also its ball under water, that one may observe the liquor at D, in each experiment, when the thermometer stands at the same height as before. The water is poured out when the instrument is carried,

which



T. Jefferys sculp.

which one may do conveniently by means of the wooden frame, which is ſet upright by the three ſcrews S, S, S, *ibid.* n° 4. and a line and plummet P P, n° 5. At the back part of the wooden frame, from the piece at top K, hangs the plummet P, over a braſs point at N; M *m* are brackets, to make the upright board K N, continue at right angles with the horizontal one at N. N° 6. repreſents a front-view of the machine, ſuppoſing the fore-part of the tin-veſſel tranſparent; and here the braſs-ſocket of the recurve-tube, into which the ball is ſcrewed, has two wings at I I, fixed to the bottom that the ball may not break the tube by its endeavour to emerge, when the water is poured in as high as *g h*.

After the Dr. had contrived this machine, he conſidered that, as the tube is of a very ſmall bore, if the liquor ſhould riſe into the ball at A, n° 3. in carrying the inſtrument from one place to another, ſome of it would adhere to the ſides of the ball A, and upon its deſcent in making the experiment, ſo much might be left behind, that the liquor would not be high enough at D, to ſhew the difference of the level; therefore, to prevent that inconveniency, he contrived a blank ſcrew, to ſhut up the hole at A, as ſoon as one experiment is made, that in carrying the machine, the air in A, may ballance that in C, ſo that the liquor ſhall not run up and down the tube, whatever degree of heat and cold may act upon the inſtrument, in going from one place to another. Now becauſe one experiment may be made in the morning, the water may be ſo cold, that when a ſecond experiment is made at noon, the water cannot be brought to the ſame degree of cold it had in the morning; therefore, in making the firſt experiment, warm water muſt be mixed with the cold, and when the water has ſtood ſome time before it comes to be as cold as it is likely to be at the warmeſt part of that day, obſerve and ſet down the degree of the thermometer at which the ſpirit ſtands, and likewiſe the degree of the water in the barometer at D; then ſcrew on the cap at A, pour out the water, and carry the inſtrument to the place whoſe level you would know; then pour in your water, and when the thermometer is come to the ſame degree as before, open the ſcrew at top, and obſerve the liquor in the barometer.

The doctor's ſcale for the barometer is ten inches long, and divided into tenths; ſo that ſuch an inſtrument will ſerve for any heights not exceeding ten feet, each tenth of an inch anſwering to a foot in height.

The Dr. made no allowance for the decreaſe of denſity in the air, becauſe he did not propoſe this machine for meaſuring mountains (though with a proper allowance for the decreaſing denſity of the air, it will do very well) but for heights that want to be known in gardens, plantations, and the conveyance of water; where an experiment that anſwers two or three feet in a diſtance of twenty miles, will render this a very uſeful inſtrument.

Foot-LEVEL. See the article FOOT-LEVEL.

Artillery-Foot-LEVEL is in form of a ſquare, having its two legs or branches of an equal length, at a juncture whereof is a little hole, whence hangs a thread and plummet, playing on a perpendicular line in the middle of a quadrant. It is divided into twice 45 degrees from the middle *ibid.* n° 7.

This inſtrument may be uſed on other occaſions, by placing the ends of its two branches on a plane; for when the thread plays perpendicularly over the middle diviſion of the quadrant, that plane is aſſuredly level. To uſe it in gunnery place the two ends on the piece of artillery, which you may raiſe to any propoſed height, by means of the plummet, whoſe thread will give the degree above the level.

Carpenter's and Paviour's LEVEL, conſiſts of a long ruler in the middle whereof is fitted, at right angles, another ſomewhat bigger, at the top of which is faſtened a line, which, when it hangs over a fiducial line at right angles with the baſe, ſhews that the ſaid baſe is horizontal. Sometimes this level is all of one board. *Ibid.* n° 8.

Gunner's LEVEL, for levelling cannons and mortars, conſiſts of a triangular braſs-plate, about four inches high, *ibid.* 9. at the bottom of which is a portion of a circle, divided into 45 degrees, which number is ſufficient for the higheſt elevation of cannons and mortars, and for giving ſhot the greateſt range: on the center of this ſegment of a circle is ſcrewed a piece of braſs, by means of which it may be fixed or ſcrewed at pleaſure; the end of this piece of braſs is made ſo as to ſerve for a plummet and index, in order to ſhew the different degrees of elevation of pieces of artillery. This inſtrument has

has alfo a brafs-foot, to fet upon cannons or mortars, fo as when thofe pieces are horizontal, the inftrument will be perpendicular. The foot of this inftrument is to be placed on the piece to be elevated, in fuch a manner, as that the point of the plummet may fall on the proper degree: this is what they call levelling the piece.

Mafon's LEVEL, is compofed of three rules, fo joined as to form an ifoceles-rectangle, fomewhat like a roman A, at the vertex whereof is faftened a thread, from which hangs a plummet, that paffes over a fiducial line, marked in the middle of the bafe, when the thing, to which the level is applied, is horizontal; but declines from the mark, when the thing is lower on one fide than on the other.

Plumb, or *Pendulum*-LEVEL, that which fhews the horizontal lines by means of another line perpendicular to that defcribed by a plummet or pendulum. This inftrument, *ibid.* n° 10. confifts of two legs or branches, joined together at right angles, whereof that which carries the thread and plummet is about a foot and a half long; the thread is hung towards the top of the branch, at the point 2. the middle of the branch where the thread paffes is hollow, fo that it may hang free every where: but towards the bottom where there is a little blade of filver, whereon is drawn a line perpendicular to the telefcope, the faid cavity is covered by two pieces of brafs, making as it were a kind of cafe, left the wind fhould agitate the thread, for which reafon the filver blade is covered with a glafs G, to the end that it may be feen when the thread and plummet play upon the perpendicular: the telefcope is faftened to the other branch of the inftrument, and is about two feet long; having an hair placed horizontally acrofs the focus of the object-glafs, which determines the point of the level. The telefcope muft be fitted at right angles to the perpendicular. It has a ball and focket, by which it is faftened to the foot, and was invented by M. Picard.

Reflecting LEVEL, that made by means of a pretty long furface of water reprefenting the fame object inverted which we fee erected by the eye, fo that the point where thefe two objects appear to meet, is a level with the place where the furface of the water is found. This is the invention of M. Mariotte.

There is another reflecting level confifting of a mirror of fteel, or the like, well polifhed, and placed a little before the object-glafs of a telefcope, fufpended perpendicularly. This mirror muft make an angle of 45° with the telefcope, in which cafe the perpendicular line of the faid telefcope is converted into a horizontal line, which is the fame with the line of level. This is the invention of M. Caffini.

Water-LEVEL, that which fhews the horizontal line by means of a furface of water or other liquor, founded on this principle, that water always places itfelf level. See the article FLUID.

The moft fimple is made of a long wooden trough, or canal, whofe fides are parallel to the bafe, fo that being equally filled with water, its furface fhews the line of level. This is the chorobates of the antients. See CHOROBATA.

It is alfo made with two cups fitted to the two ends of a pipe, three or four feet long, about an inch in diameter, by means whereof the water communicates from the one to the other cup; and this pipe being moveable on its ftand by means of a ball and focket, when the two cups become equally full of water, their two furfaces mark the line of level.

This inftrument, inftead of cups, may alfo be made with two fhort cylinders of glafs three or four inches long, faftened to each extreme of the pipe with wax or maftic. Into the pipe is poured fome common or coloured water, which fhews itfelf through the cylinders, by means whereof the line of level is determined; the height of the water, with refpect to the center of the earth, being always the fame in both cylinders: this level, tho' very fimple, is yet very commodious for levelling fmall diftances.

LEVEL *of Mr. Huygens's invention*, confifts of a telefcope *a*, *ibid.* n° 11. in form of a cylinder going through a ferril in which it is faftened by the middle. This ferril has two flat branches *b b*, one above, and the other below, at the ends whereof are faftened little moving pieces which carry two rings, by one of which the telefcope is fufpended to an hook at the end of the fcrew 3, and by the other a pretty heavy weight is fufpended, in order to keep the telefcope in equilibrio. This weight hangs in the box 5, which is almoft filled with linfeed oil, oil of walnuts, or other matter that will not eafily coagulate, for more aptly fettling the ballance of the weight and telefcope. The inftrument carries two telefcopes clofe and very parallel to each other; the eye-glafs of the one

one being against the object-glass of the other, that one may see each way without turning the level. In the focus of the object-glass of each telescope must a little hair be strained horizontally, to be raised and lowered as occasion requires by a little screw. If the tube of the telescope be not found level when suspended, a ferril or ring, 4, is put on it, and is to be slid along till it fixes to a level. The hook on which the instrument is hung, is fixed to a flat wooden cross; at the ends of each arm whereof there is a hook serving to keep the telescope from too much agitation in using or carriage. To the said flat cross is applied another hollow one, that serves as a case for the instrument; but the two ends are left open, that the telescope may be secured from the weather, and always in a condition to be used. The foot of this instrument is a round brass plate, to which are fastened three brass-ferrils, moveable by means of joints wherein are put staves, and on this foot is placed the box.

N° 12. marked I, is a ballance-level; which being suspended by the ring, the two sights when in equilibrio, will be horizontal, or in a level.

LEVELLING, the art of finding a line parallel to the horizon at one or more stations, in order to determine the height of one place with regard to another. See the preceding article.

A truly level surface is a segment of a spherical surface, which is concentric to the globe of the earth. A true line of level is an arch of a great circle, which is imagined to be described upon a truly level surface. The apparent level is a straight line drawn tangent to an arch or line of true level. Every point of the apparent level, except the point of contact, is higher than the true level: thus let E A G (plate CLVII. fig. 1. n° 1.) be an arch of a great circle drawn upon the earth; to a person who stands upon the earth at A, the line H D is the apparent level parallel to his rational horizon R R; but this line, the farther it is extended from his station A, the farther it recedes from the center; for B C is longer than A C, and D C is longer than B C, *&c.*

The common methods of levelling are sufficient for laying pavements of walks, for conveying water to small distances, for placing horizontal dials, or astronomical instruments; but in levelling the bottoms of canals which are to convey water to the distance of many miles, the difference between the apparent and true level must be taken into the account: thus let I A L (*ibid.* n° 2.) be an arch of a great circle upon the earth: let it be required to cut a canal whose bottom shall be a true level from A to B, of the length of 5078 feet: the common method is to place the levelling instrument in the bottom of the canal at A, and looking through the sights placed horizontally at a stick set up perpendicular at B, to make a mark where the visual ray or point of the apparent level points at E, and then to sink the bottom of the canal at B as much below E as A is below D. But this will not give the true level: for according to Cassini's calculation, at the distance of 5078 feet the apparent level is seven inches above the true; and therefore to make a true level, B must be sunk seven inches lower than the apparent level directs; so that if A be four feet below D, B must be four feet seven inches below the mark E. We have here mentioned the error which will arise from placing the level at one end of the line to be levelled, and shewn how to correct it; but in most cases it is better to take a station in the middle of the line to be levelled: thus if the points H and B are to be levelled, place the instrument in the middle at A, and setting up sticks perpendicular at H and B, make marks upon each stick where the apparent level points, as E and F; those points are level: and if you sink H as much below F, as B is below E, H A B will be a true level.

The operation of levelling is as follows: suppose the height of the point A, (*ibid.* n° 3.) on the top of a mountain above that of the point B, and at the foot thereof, be required. Place the level about the middle distance between the two points as in D, and staffs in A and B; and let there be persons instructed with signals for raising and lowering, on the said staffs, little marks of pasteboard or other matter, the level being placed horizontally by the bubble, *&c.* Look towards the staff A E, and cause the mark so raised to be lowered till the middle, upper edge, or other most conspicuous part, appear in the visual ray. Then measuring exactly the perpendicular height of the point E above the point A, which suppose six feet four inches; set that down in your book: then turn the level horizontally about, that the eye-

glafs of the telefcope may be ftill next the eye when you look the other way; if you have only plain fights, the inftrument need not be turned; and caufe the perfon at the ftaff B, to raife or lower his mark till fome confpicuous part of it fall in the vifual ray, as at C: then meafure the perpendicular height of C above B, which fuppofe fixteen feet fix inches: fet this alfo down in the book above the other number of the firft obfervation; fubtract the one from the other, the remainder will be ten feet two inches, which is the difference of the level between A and B, or the height of the point A above the point B.

If the point D, where the inftrument is fixed, be in the middle between the two points A and B, there will be no neceffity for reducing the apparent level to the true level; the vifual ray in that cafe being raifed equally above the true level.

If it be further required to know whether there be a fufficient defcent for conveying water from the fpring A (*ibid.* n° 4.) to the point B. Here in regard the diftance from A to B is confiderable, it is required that feveral operations be made. Having then chofen a proper place for the firft ftation, as at I, fet up a ftaff in the point A, near the fpring, with a proper mark to flide up and down the ftaff, as L, and meafure the diftance from A to I, which fuppofe two thoufand yards. Then the level being adjufted in the point I, let the mark L be raifed and lowered till fuch time as you fpy fome confpicuous part of it through the telefcope or fights of the level, and meafure the height A L, which fuppofe thirteen feet five inches. But in regard the diftance A I is two thoufand yards, you muft have recourfe to your table for a reduction, fubtracting eleven inches, which will leave the height of A L twelve feet fix inches, and this note down in your book. Now turn the level horizontally about, fo that the eye-glafs of the telefcope may be towards A, and fixing up another ftaff at H, caufe the mark G to be moved up and down till you fpy fome confpicuous part through the telefcope or fights. Meafure the height H G, which fuppofe feven yards one foot two inches. Meafure likewife the diftance of the points I H, which fuppofe one thoufand three hundred yards, for which diftance four inches eight lines muft be fubtracted from the height H G, which confequently will only leave feven yards nine inches four lines, to be taken down in your book. This done, remove the level forwards to fome other eminence as E, whence the ftaff H may be viewed; as alfo another ftaff at D, near the place whither the water is to be conveyed. The level being again adjufted in the point E, look back to the ftaff H, and managing the mark as before, the vifual ray will give the point F. Meafure the height H F, which fuppofe eleven feet fix inches. Meafure likewife the diftance H E, which fuppofe a thoufand yards, for which there is two inches nine lines of abatement, which being taken from the height H F, there will remain eleven feet three inches three lines, which enter in your book. Laftly, turning the level to look at the next ftaff D, the vifual ray will give the point D. Meafure the height of D from the ground, which fuppofe eight feet three inches. Meafure alfo the diftance from the ftation E to B, which fuppofe nine hundred yards, for which diftance there are two inches three lines of abatement, which being taken from the height B D, there will remain eight feet nine lines, which enter as before.

For the manner of entering down obfervations in your book, obferve that when a proper place or ftation for the level between the two points has been pitched upon, write down the two heights obferved at that ftation in two different columns, *viz.* under the firft column, thofe obferved in looking through the telefcope when the eye was from the fpring, or towards the point, which we may call back-fights; and under the fecond column, thofe obferved when the eye was next the fpring, which we call forefights. Having fummed up the heights of each column feparately, fubtract the leffer from the greater, the remainder will be the difference of the level between the points A and B. If the diftance of the two points be required, add all the diftances meafured together; and dividing the difference of height by the yards of the diftances, for each two hundred yards you will have a defcent of about two inches nine lines.

Dr. Halley fuggefts a new method of levelling, performed wholly by means of the barometer, in which the mercury is found to be fufpended to fo much the lefs height, as the place is farther remote from the center of the earth; whence the different heights of the mercury in two places,

places gives the difference of level. This method has been put in practice by ſome of the french academy.

LEVELLING-STAVES, inſtruments uſed in levelling, ſerving to carry the marks to be obſerved, and at the ſame time to meaſure the heights of thoſe marks from the ground. They uſually conſiſt each of two long wooden rulers, made to ſlide over one another, and divide into feet, inches, &c.

LEVER, or LEAVER, in mechanics, an inflexible right line, rod, or beam, ſupported in a ſingle point on a fulcrum or prop, and uſed for the raiſing of weights; being either void of weight itſelf, or at leaſt having ſuch a weight as may be commodiouſly counter-ballanced.

The lever is the ſecond, or, as others will have it, the firſt of thoſe called mechanical powers, or ſimple machines, as being of all others the moſt ſimple; and is chiefly applied, for raiſing weights to ſmall heights.

In a lever there are three things to be conſidered, the weight to be raiſed or ſuſtained, as O, (plate CLVII. fig. 2. n° 1.) The power by which it is to be raiſed or ſuſtained, as B. And the fulcrum or prop D, whereon the lever is ſuſtained, or rather on which it moves round, the fulcrum remaining fixed.

Levers are of three kinds; the firſt is that wherein the prop or fixed point D, (n° 1.) is between the weight ſuſpended at the end O, and the power applied at the other end B: it is plain that ſciſſars, pincers, ſnuffers, &c. are levers of this kind. The lever of the ſecond kind, is that wherein the fulcrum C, (n° 2.) is at one end, and the power applied at the other end B, the weight D being ſuſpended at the point A between the ends; that is, between the power and the fixed point: it is plain that the oars and rudder of a boat are ſuch levers; as alſo cutting knives as are fixed at one end, as thoſe uſed by druggiſts for cutting aromatic wood and roots, by bakers for cutting their bread; and likewiſe doors, whoſe hinges are as the fixed point.

The lever of the third kind, is that whoſe fixed point C, (n° 3.) is at one end, and the weight D ſuſpended at the other end A, the power being applied at the point B between the ends; that is, between the weight and the fulcrum: it is plain that a ladder which is lifted by the middle, in order to rear it againſt a wall, is a lever of this kind.

There is yet a fourth kind of lever, called the bended lever, ſo called from its being bent at the fixed point C, (n° 4.): it appears plainly that ſuch a lever is of the firſt kind, becauſe the weight D hangs at its end A, and the power is applied at its other end B, where it draws by the line of direction B E: a hammer to draw out a nail, is a bended-lever.

We ſhall here demonſtrate the law of the equilibrium in the lever, which is the foundation of all the other propoſitions of this kind in mechanics.

Theorem I. Let A B (n° 5.) be a lever only moveable round the fulcrum C, the ſpace deſcribed by each of its points will be as its diſtance from the fulcrum.

For let the lever be moved out of the ſituation A C B, into the ſituation *a* C *b*, the point A will deſcribe the periphery A *a*, but B will paſs over the periphery B *b*. Now by reaſon of the ſimilar ſectors A C *a*, B C *b*, A *a* is to B *b*, as A C to B C; that is, the ſpaces deſcribed by the points A and B, are as their diſtances from the fulcrum. If to the points A and B be applied powers drawing the brachia of the lever perpendicularly, the ſpaces that are deſcribed by them according to or contrary to their propenſions, are not the peripheries A *a*, B *b*, but the perpendiculars *a* F, *b* E, let fall on the brachia of the lever. For the power in A is moved, according to its proper direction or propenſion, through the ſpace *a* F only, and no farther: as, for the ſame cauſe, the way paſſed thro' by the power B, according to its proper direction, is to be eſtimated by *b* E. But by reaſon of the equiangular triangles *a* C F, *b* C E, *a* F is to *b* E as *a* C or A C to *b* C or B C; that is, the ſpaces run over by powers according to their proper directions, will be as their diſtances from the fulcrum.

But if the direction of the power is not a right line, perpendicular to the brachium of the lever A C, (n° 6.) let, from the fulcrum to the line of direction, be drawn the perpendicular C G, and the ſpace deſcribed by the power according to its propenſion, will be proportionable to that perpendicular: for it matters not whether the thread F G A, by which the power acts, is affixed to the point G or A, or indeed to the point D; for the line of direction remaining the ſame, its force to move round the plane A D C B, will be the ſame, as if the thread was fixed to the point G, and the way deſcribed by it in a given time, according to its proper

proper direction, will be proportionable to the right line C G. Wherefore it is manifest in every case, that the way described by any force according to its proper direction, is proportionable to the distance of the line of direction from the fulcrum.

Theorem II. In a lever, the moving force or power that has to the weight the same ratio, which the distance of the line of direction of the weight from the fulcrum, has to the distance of the direction of the power from the fulcrum, will sustain the weight; and therefore if it be ever so little increased, it will raise the weight.

It is manifest from the preceding theorem, that the spaces which are described by a power and weight according or contrary to their proper propensions, are proportionable to the distances of the lines of direction from the fulcrum; but the velocities are proportionable to these spaces, and consequently will be also proportionable to the distances. If therefore the power P is to the weight Q, (n° 7.) as C Q, the distance of the direction of the weight from the fulcrum to C A, the distance of the direction of the power from the fulcrum, the power will be to the weight, as the velocity of the weight to the velocity of the power; the momentum therefore of the power, will be equal to the momentum of the weight: and consequently the power will be equivalent to the weight; which if it be ever so little increased, it will raise the weight. Q. E D.

Hence appears the reason, why by the statera romana, or steelyard, as it is commonly called, the weights of different bodies are examined all by one and the same weight only. For this instrument is a lever of unequal brachia, one whereof, C Q, is extended in length from the axis of motion C, and which ought to be the axis of equilibrium, suppose one inch, or less; the other brachium, A C, may be of any greater length that is capable of being exactly divided into parts, each equal to C Q, and numbered by figures, 1, 2, 3, 4, *&c.* Then if the body whose weight we want to discover is hung on at Q, the given or known weight P is moveable on the contrary brachium; and by removing it from or bringing it nearer the center C, is discovered the distance where is an exact equilibrium. See the article BALLANCE.

Thus, there is a great affinity betwixt the lever and common ballance, only the center is not in the middle, but near one end; for which reason it is used to elevate or raise a great weight.

If we examine the instruments in common use, we shall find many of them reducible to levers of one kind or other, as hinted above. Thus a pair of pincers is made up of two levers of the first kind, whose common center of motion is at the rivet C, (*ibid.* fig. 3. n° 1.) the power being applied at the handles B *b* to press them together, and thereby pinch the body D between the opposite extremities A *a*; in which case the power acts with so much the greater force, as the handles C B, C *b*, are longer than the distance C A, *c a*. So a pair of common sciffars, (*ibid.* n° 2.) acts upon the same principles. The force of a lever in this way, is remarkable in the brasier's and tinman's sheers, whereby one man pressing upon the handle B, (*ibid.* n° 3.) and raising the lower side A C, moveable about the center C, is able to cut a plate of brass or copper D, a quarter of an inch thick; the other shorter lever *a* C E being riveted to a couple of strong standards fixed in the block F. The little cart, B C A, (*ibid.* n° 4.) likewise belongs to the levers of the first kind; whereby a single man at B, is able to lift a heavy stone D, upon the axle-tree of the wheels E F as a fulcrum; and being raised, by means of the same wheels, can convey it to the place required.

The cutting knife, C D B, (*ibid.* n° 5.) used by many artificers, is a lever of the second kind; as being moveable on the joint or center of motion C, whereby it is fastened to the plank C E; and the power applied at B to cut the weight D, placed between it and the center of motion. A pair of bellows are two levers of the second kind, whose common center of motion is at the end of the boards where the nose begins; the power being applied at the handles, whilst the air to be pressed out is the weight. The oars of a boat or galley, as well as the rudder, are likewise levers of the second kind; for the water at C, (*ibid.* n° 6. and 7.) makes a resistance as a fulcrum, whilst the man or power acts at B to push forward the vessel by that part of the oar or rudder D, which rest upon it. The masts of ships are also to be reckoned among the levers of the second kind; the fulcrum being at the bottom of the ship B, (*ibid.* n° 7.) and the moving force the wind gathered in the sail, which by the

the help of the sail-yard DAE is applied at A, the upper end of the mast; whilst the weight or body to be moved, *viz.* the vessel C, is placed between the power and fulcrum: hence appears the reason why a ship sails swiftest when the yard is raised high, because of its greater distance from the fulcrum.

The sheep-sheers, W P C, (*ibid.* n° 8.) are two levers of the third kind; the common center of motion being at the springing bow at C, whilst the power or hand is applied at P *p*, and the wool to be cut is the weight at W. A pair of tongs are likewise levers of the third kind. But the use of levers of the third kind is most beautifully shewn in the animal body, where the all-wise Creator has given animals a power of moving their limbs with great velocity, by applying the power of the muscles very near the center of motion; for the theory of which, see the articles MUSCLE and OSTEOLOGY.

LEVERET, among sportsmen, denotes a hare in the first year of her age.

LEVIGATION, in pharmacy and chemistry, the reducing hard and ponderous bodies to an impalpable powder, by grinding them on a porphyry, or the like. See the article PORPHYRY.

It is generally necessary in levigation, to add some fluid to the matter, which purpose is answered equally well by common water, as by rose or other simple distilled water; since, in drying the powders, these last totally exhale without having imparted any virtue to the preparation.

LEVITE, in a general sense, means all the descendants of Levi, among whom were the jewish priests themselves, who being descended from Aaron, were likewise of the race of Levi: but it is more particularly used for an order of officers in that church, who were employed in performing the manual service of the temple, such as in fetching wood, water, and other things necessary for the sacrifices; and in singing and playing upon instruments of music.

The consecration of the levites was to be performed with the following ceremonies: they were to be sprinkled with the water of expiation, to shave all their flesh, and wash their cloaths: they were then to bring two bullocks before the door of the tabernacle, where the whole congregation laid their hands upon the levites heads: the bullocks were then sacrificed, one for a burnt offering, and the other for a sin offering; and, lastly, they were to be presented to the high-priest, who was to consecrate them to the Lord.

The levites were subsisted by the tythe of all the corn, fruit and cattle, throughout Israel; a tythe of which tythe they were to give to the priests: they had also forty-eight cities for their habitation; and while they were actually employed in the service of the temple, they were subsisted out of the daily sacrifices.

LEVITICUS, a canonical book of the Old Testament, so called from its containing the laws and regulations relating to the priests, levites, and sacrifices.

The seven first chapters of this book prescribe the ceremonies to be observed in offering burnt-sacrifices, meat-offerings, peace-offerings, &c. then Moses relates in what manner the priests were to be consecrated, and the misfortune of Nadab and Abihu, who offered incense to the Lord with strange fire. Upon this occasion, he prescribes some laws concerning the mourning of the priests, and forbids their drinking wine, while they were employed in the service of the tabernacle. In the eleventh, twelfth, thirteenth, and fourteenth chapters, he lays down rules for distinguishing clean and unclean beasts, and concerning the leprosy, purifications, &c. appoints the ceremonies to be observed upon the great day of expiation: regulates the degrees of kindred within which persons were allowed or forbidden to marry: prohibits alliances with the Canaanites, and also idolatry, theft, perjury, calumny, &c. In the twenty third chapter, he takes notice of the principal annual festivals, the passover, pentecost, &c. prescribes what was to be observed in the sabbatical and jubilee-years, and concludes with regulations concerning vows and tythes.

LEVITY, in physiology, the privation or want of weight in any body, when compared with another that is heavier than it, in which sense it stands opposed to gravity. See the articles GRAVITATION and GRAVITY.

The schools maintain, that there is such a thing as positive and absolute levity, and impute to this the rise or emergency of bodies lighter in specie than the bodies wherein they rise; but from the laws of gravitation, which we have delivered under that article, we learn that there is no such thing as absolute levity in nature: besides, Mr. Boyle has overthrown this

doctrine of positive and absolute levity by repeated experiments, as may be seen at large in the second volume of Shaw's Boyle, page 362—365.

LEVERPOOL. See LIVERPOOL.

LEUROUX, a town of France, in the province of Orleanois, thirty-five miles south-west of Bourges.

LEUTKIRK, a town of Germany, in the circle of Swabia, thirty-five miles south of Ulm.

LEUTMERTIS, a city of Bohemia, 25 miles north of Prague.

LEVY, in law, signifies to gather or collect, as to levy money; and to levy a fine of lands, is the passing a fine.

LEWARDEN, a city of the United Provinces, the capital of west Friesland: east long. 5° 35′, north lat. 53° 20′.

LEWES, a borough-town of Sussex, forty miles south of London, which sends two members to parliament.

LEWIS, the most northerly of any of the western islands of Scotland, lying in 8° odd minutes west long. and between 58° and 59° odd minutes north lat.

LEWIS. See the article FORT-LEWIS.

LEWIS-PORT. See PORT LOUIS.

LEWISBOURG, the capital of Cape Breton, in North America: west long. 61° 30′, north lat. 46° 50′.

LEXICON, the same as dictionary, but chiefly used in speaking of greek dictionaries. See DICTIONARY.

LEYDEN, a city of Holland, in which there is a famous university, situated twenty miles south of Amsterdam.

LEYNA, a river of Germany, which rises in the confines of Hesse, and discharges itself into the river Aller, at Batmar.

LEYS, in country-affairs, denote pasture-grounds, or arable lands turned into pasture. See the article PASTURE.

LEYTE, one of the Philippine islands, separated from the island Philippina by a narrow channel: east long. 123°, north lat. 11°.

LEZINA, a town of the kingdom of Naples, situated on a bay of the gulph of Venice, seventy-five miles north-east of Naples.

LHON, a river which rises in the landgravate of Hesse-Cassel, and falls into the Rhine almost opposite to Coblentz.

LIBANUS, a range of mountains in asiatic Turky, between Syria and Palestine, which extend from Sidon on the Levant, eastward beyond Damascus.

LIBATION, a religious ceremony among the antient pagans, which consisted in an effusion of liquors poured on the head of the victims prepared for sacrifice.

Libations were also in use among the Hebrews, who poured a hin of wine on the victim after it was killed, and the several pieces of the sacrifice were laid on the altar, ready to be consumed in the flames.

The mingrelian christians use a sort of libation at their meals. Before they sit down to table, they take up the first glass of wine that is poured out, and after calling upon the name of the Lord, and paying their respects to the company, sprinkle part of it upon the floor. We meet with the same custom among the antient Romans.

LIBAW, a port-town of Poland, in the dutchy of Courland, situated on a bay of the Baltic: east longitude 21°, north latitude 56° 40′.

LIBEL, injurious reproaches or accusations against a person, written and published in order to expose him to public contempt, hatred or ridicule. The lawyers say, a libel may also be without writing, as where a person is painted with asses-ears, a fool's coat, &c. or where a gallows, or any other ignominious sign, is fixed at his door.

Libels are criminal, because where they are made against a private man, they may be the means of exciting him or his friends to seek revenge, and consequently to break the peace: on this account it is no justification of a libel that its contents are true, or that the person libelled has a bad character; for a libel is the more provoking, in proportion as it has the greater appearance of truth: it is therefore held, that in a prosecution on an indictment or information, it is not material whether the matter of a libel be true or false; but in an action upon the case, a defendant may justify that the matter is true. The sending a scandalous letter to the party himself, without shewing or publishing it to others, is no libel; though if it be sent to a third person, or otherwise dispersed, it is a publication of the libel. In the making of libels, if one dictates, another writes, and a third approves of what is written, they are all deemed makers or composers of the libel. The composer, procurer, and publisher of a libel are liable to a fine, imprisonment, the pillory, or the like corporal punishment, at the discretion of the court where the trial is held, and according to the heinousness of the offence.

LIBEL,

LIBEL, in the law of Scotland, signifies an indictment. See INDICTMENT.

LIBELLA, or LIBELLULA, in the history of insects, a genus of four-winged flies, called in english dragon-flies, or adder-flies; the characters of which are, that they are furnished with jaws, the antennæ are short, and the tail terminated by a kind of forceps.

LIBER, among botanists, denotes the rind or inner bark of trees. See the article BARK.

LIBERALIA, in roman antiquity, the same with the dionysia of the Greeks. See the article DIONYSIA.

LIBERATE, in law, a writ that lies for the payment of a pension, or annual sum, granted under the great seal; being directed to the treasurer and chamberlains of the exchequer.

It is also the name of two other writs, one directed to the sheriff of a county, commanding him to deliver possession of lands or goods extended upon the forfeiture of a recognizance; the other directed to a gaoler for delivery of a prisoner, that has put in bail for his appearance.

LIBERIA, in roman antiquity, a festival observed on the sixteenth of the calends of April, at which time the youth laid aside their juvenile habit for the toga virilis, or habit peculiar to grown men. See the article TOGA.

LIBERTATE PROBANDA, an antient writ for persons claimed as villains, to prove themselves free. See VILLAIN.

LIBERTATIBUS ALLOCANDIS, a writ which lies for a citizen or burgess, to have his privilege allowed.

LIBERTUS, in roman antiquity, a person who from being a slave had obtained his freedom. See MANUMISSION.

The difference between the liberti and libertini was this: the liberti were such as had been actually made free themselves, and the libertini were the children of such persons.

LIBERTY, *libertas*, in general, denotes a state of freedom, in contradistinction to slavery. See the article FREEDOM.

According to Cicero, liberty is the power of living as a man pleases, or without being controlled by another.

In a legal sense, liberty signifies some privilege that is held by charter or prescription.

LIBERTY *of the tongue*, in the manege, a void space left in the middle of a bit to give place to a horse's tongue. See the article BIT.

LIBOURN, a town of France, ten miles north-east of Bourdeaux.

LIBRA, the BALANCE, in astronomy, one of the twelve signs of the zodiac, the sixth in order; so called because when the sun enters it, the days and nights are equal, as if weighed in a balance.

Authors enumerate from ten to forty-nine stars in this sign.

LIBRA, in roman antiquity, a pound weight; also a coin, equal in value to twenty denarii.

LIBRARY, an edifice or apartment destined for holding a considerable number of books placed regularly on shelves; or, the books themselves lodged in it.

The first who erected a library at Athens was the tyrant Pisistratus, which was transported by Xerxes into Persia, and afterwards brought back by Seleucus Nicanor to Athens. Plutarch says, that under Eumenes there was a library at Pergamus that contained 200,000 books. That of Ptolemy Philadelphus, according to A. Gellius, contained 700,000, which were all burnt by Cæsar's soldiers. Constantine and his successors erected a magnificent one at Constantinople, which in the eighth century contained 300,000 volumes, and among the rest, one in which the Iliad and Odyssee were written in letters of gold, on the guts of a serpent; but this library was burnt by order of Leo Isaurus. The most celebrated libraries of antient Rome, were the Ulpian and the Palatine, and in modern Rome, that of the Vatican; the foundation of the Vatican library was laid by pope Nicholas, in the year 1450; it was afterwards destroyed in the sacking of Rome, by the constable of Bourbon, and restored by pope Sixtus V. and has been considerably enriched with the ruins of that of Heidelberg, plundered by count Tilly in 1682. One of the most complete libraries in Europe, is that erected by Cosmo de Medicis; though it is now exceeded by that of the french king, which was begun by Francis I. augmented by cardinal Richelieu, and completed by M. Colbert. The emperor's library at Vienna, according to Lambecius, consists of 80,000 volumes, and 15,940 curious medals. The Bodleian library at Oxford, exceeds that of any university in Europe, and even those of any of the sovereigns of Europe, except the emperor's and the french king's, which are each of them older by a hundred years. It was first opened in 1602, and

and has since been increased by a great number of benefactors: indeed the Medicean library, that of Bessarion at Venice, and those just mentioned, exceed it in greek manuscripts, but it outdoes them all in oriental manuscripts; and as to printed books, the Ambrosian at Milan, and that of Wolfembuttle, are two of the most famous, and yet both are inferior to the Bodleian. The Cotton-library consists wholly of manuscripts, particularly of such as relate to the history and antiquities of England; which, as they are, now bound, make about 1000 volumes.

In Edinburgh there is a good library belonging to the university, well furnished with books; which are kept in good order, and cloistered up with wire-doors, that none but the keeper can open; a method much more commodious than the multitude of chains used in other libraries. There is also a noble library of books and manuscripts, belonging to the gentlemen of the law.

LIBRATION, in astronomy, an apparent irregularity of the moon's motion, whereby she seems to librate about her axis, sometimes from the east to the west, and now and then from the west to the east; so that the parts in the western limb or margin of the moon sometimes recede from the center of the disk, and sometimes move towards it, by which means they become alternately visible and invisible to the inhabitants of the earth. See the article MOON.

LIBRATION *of the earth*, is sometimes used to denote the parallelism of the earth's axis, in every part of its orbit round the sun. See EARTH and PARALLELISM.

LIBYA, in antient geography, a large extent of Africa, lying south-west of Egypt.

LICENCE, in law, an authority given to a person to do some lawful act.

A licence is a personal power, and therefore cannot be transferred to another. If the person licensed abuse the power given him, in that case he becomes a trespasser.

LICENCE TO ARISE, in law, is a space of time given by the court to a tenant who is essoined de malo lecti, in a real action, to get out of his bed.

LICENTIATE, one who has obtained the degree of a licence.

The greatest number of the officers of justice in Spain, are distinguished by no other title but that of licentiate. In order to pass licentiate in common law, civil law, and physic, they must have studied seven years; and in divinity, ten. Among us, a licentiate usually means a physician who has a licence to practise, granted by the college of physicians, or the bishop of the diocese. See the article COLLEGE *of physicians*.

LICHEN, LIVER-WORT, in botany, a genus of the cryptogamia class of plants, which have the most perfect fructification of all the mosses: the flowers are monopetalous, standing on a pedicle, and divided into segments at the limb, somewhat like stars, buttons, mushrooms, &c. See plate CLVIII. fig. 1.

The grey ground liver-wort, found plentifully with us in woods and heaths, is famous for its virtues against the bite of a mad dog: it is the basis of the pulvis antilyssus of the shops.

LICTORS, *lictores*, in roman antiquity, the serjeants or beadles who carried the fasces before the supreme magistrates: it was also a part of their office to be the public executioners in beheading, scourging, &c.

As to their number, a dictator had twenty-four, a consul twelve, the master of the horse six, a prætor six, and each vestal virgin had one, whenever they appeared abroad.

LIDD, a market-town of Kent, situated near the english channel, five miles south west of Romney.

LIDDESDALE, a county of Scotland, bounded by Tiviotdale, on the north; Cumberland, on the south-east; and Annandale, on the south-west.

LIEGE, in law, a term sometimes used for liege-lord, or one who owns no superior; and sometimes for liege-man, or one who owes allegiance to the liege-lord. In our statutes, the king's subjects are sometimes called lieges, or liege-people.

LIEGE, in geography, the capital of the bishopric of the same name in Germany, situated on the river Maes, twelve miles south of Maestricht: east long. 5° 36′, north lat. 50° 40′.

LIEGEANCE, in law. See the article ALLEGIANCE.

LIEN, the spleen, in anatomy. See the article SPLEEN.

LIENTERY, is a flux of the belly, in which, whatever is taken in is discharged by stool as it is swallowed, or very little altered either in colour or substance. A pain of the stomach, says Etmuller, is an inseparable attendant of a lientery, and

and it always torments the patient moſt after eating till he hath gone to ſtool. The urine is in a ſmall quantity, and high coloured. A ſcorbutic lientery is a very dangerous diſtemper, hard to be cured, and very ſubject to relapſes: it diſpoſes the patient to a cachexy, or ill habit, and a tabes.

In the cure of this diſtemper, the ſtomach is, above all things, to be ſtrengthened; rhubarb ought to be taken; preparations of coral and quinces are very much commended; and, in general, all thoſe things uſed againſt vomiting are convenient here. The moſt ſimple ſtomachics, and moſt eaſily prepared, often do more good than the compounds: for example, preſerved nutmegs, or ginger, the white of eggs boiled in vinegar, or wormwood-wine prepared with maſtic.

LIERE, a town of the Auſtrian Netherlands, in the province of Brabant, twelve miles ſouth-eaſt of Antwerp.

LIERS, a village of the biſhopric of Liege, in the circle of Weſtphalia, in Germany, ſituated four miles north of Liege.

LIEUTENANT, an officer who ſupplies the place, and diſcharges the office of a ſuperior in his abſence. Of theſe, ſome are civil, as the lords-lieutenants of kingdoms, and the lords-lieutenants of counties; and others are military, as the lieutenant general, lieutenant-general of the artillery, lieutenant-colonel, lieutenant of the artillery of the tower, lieutenants of horſe, foot, ſhips of war, &c.

Lord LIEUTENANT *of Ireland*, is properly a viceroy, and has all the ſtate and grandeur of a king of England, except being ſerved upon the knee. He has the power of making war and peace, of beſtowing all the offices under the government, of dubbing knights, and of pardoning all crimes except high treaſon; he alſo calls and prorogues the parliament, but no bill can paſs without the royal aſſent. He is aſſiſted in his government by a privy-council; and, on his leaving the kingdom, he appoints the lords of the regency, who govern in his abſence.

Lords LIEUTENANTS *of counties*, are officers, who, upon any invaſion or rebellion, have power to raiſe the militia, and to gve commiſſions to colonels and other officers, to arm and form them into regiments, troops and companies. Under the lords-lieutenants, are deputy-lieutenants, who have the ſame power; theſe are choſen by the lords-lieutenants, out of the principal gentlemen of each county, and preſented to the king for his approbation.

LIEUTENANT-GENERAL, is an officer next in rank to the general; in battle, he commands one of the wings; in a march, a detachment, or a flying camp; alſo a quarter, at a ſiege, or one of the attacks, when it is his day of duty.

LIFE, *vita*, is peculiarly uſed to denote the animated ſtate of living creatures, or the time that the union of their ſoul and body laſts. See the articles ANIMAL, CIRCULATION, FUNCTION, &c.

Lord Bacon makes the prolongation of life one of the three branches into which he divides medicine. See the articles MEDICINE and LONGÆVITY.

Doctor Halley, Mr. De Moivre, and others, have taken laudable pains in eſtimating the probabilities of life from the bills of mortality; whence the value of annuities for life have been determined. See the articles MORTALITY and ANNUITY.

Mr. De Moivre obſerving that the probabilities of life decreaſed nearly in arithmetic progreſſion, when conſidered from a term given, found the following eaſy rule for the value of any annuity on a life of a given age, *viz.* $\dfrac{1-\frac{r}{n}P}{r-1}$; where P repreſents the value of an annuity certain of 1 l. for as many years as are intercepted between the age given, and the extremity of old age, ſuppoſed at 86, and that interval of life is expreſſed by n; and r ſtands for the amount of the principal and intereſt of 1 l. in one year.

The rule therefore, in words at length, will be: Take the value of an annuity certain for ſo many years as are denoted by the complement of life; multiply this value by the rate of intereſt, and divide the product by the complement of life; then let the quotient be ſubtracted from 1, and let the remainder be divided by the intereſt of 1 l. then this laſt quotient will expreſs the value of an annuity for an age given.

Thus, ſuppoſe it were required to find the preſent value of an annuity of 1 l. for an age at 50, intereſt being at 5 *per cent.* The complement of life being 36; let the value of an annuity certain, according to the given rate of intereſt, be taken from the tables of ſuch annuities, and this value will be found to be 16.5468. Let this value be multiplied by the rate of

of intereſt 1.05; the product will be 17.3741. Let this product be divided by the complement of life, that is, in this caſe, by 36, the quotient will be 0.04826; ſubtract this quotient from unity, the remainder will be 0.5174. Laſtly, divide this quotient by the intereſt of 1l. that is, in the preſent caſe, 0.05, and the new quotient will be 10.35, which will expreſs the value of an annuity of 1l. to continue during a life of 50, or, in other words, how many years purchaſe a life of 50 is worth.

On theſe principles, he has conſtructed tables of the value of annuities for lives, at different rates of intereſt; one of which we ſhall here inſert, which ſhews the value of an annuity for life, of 1l. when intereſt is at 3, 3½, 4, or 5 *per cent.* And here it is proper to obſerve, that the column, marked *Age*, ſhews the different ages for which the value of an annuity is wanted; and the correſponding columns, marked 3 *per cent.* 3½ *per cent. &c.* expreſs the value of the ſaid ages in years purchaſe, and decimals of a year. Thus, an annuity for life, for the age of 40, is worth 14.84 years purchaſe, when intereſt is at 3 *per cent.* and only 13.98 years purchaſe, when intereſt is at 3½ *per cent.* And ſo in other caſes.

Value of an annuity for life, of 1l. intereſt being

Age.	3 *per cent.*	3½ *per cent.*	4 *per cent.*	5 *per cent.*
9 and 10	19.87	18.27	16.88	14.60
8, 11	19.74	18.16	16.79	14.53
7, 12	19,60	18.05	16.64	14.47
13	19.47	17.94	16.6c	14.41
6, 14	19.33	17.82	16.5c	14.34
15	19.19	17.71	16.4	14.27
16	19.05	17.59	16.31	14.20
5, 17	18 90	17.46	16.21	14.12
18	18.76	17.33	16.10	14 05
19	18.61	17.21	15.99	13.97
4, 20	18.46	17.09	15.89	13.89
21	18.30	16.96	15.78	13.81
22	18.15	16.83	15.67	13.72
23	17.99	16.69	15.55	13.64
3, 24	17.83	16.56	15.43	13.55
25	17.66	16.42	15.31	13.46
26	17.50	16.28	15.19	13.37
27	17.33	16.13	15.04	13.28
28	17.16	15.98	14.94	13.18
29	16.98	15.83	14.81	13.09
30	16.80	15.68	14.68	12.99
2, 31	16.62	15.53	14.54	12.88
32	16.44	15.37	14.41	12.78
33	16.25	15.21	14.27	12.67
34	16.06	15.05	14.12	12.56
35	15.86	14.89	13.98	12.45
36	15.67	14.71	13.82	12.33
37	15.46	14.52	13.67	12.21
38	15.29	14.34	13.52	12,09
1, 39	15.05	14.16	13.36	11.96
40	14.84	13.98	13.20	11.83
41	14.63	13.79	13.02	11.70
42	14.41	13.59	12.85	11.57
43	14.19	13.40	12.68	11.43
44	13.96	13.20	12.50	11.29
45	13.73	12.99	12.32	11.14
46	13.49	12.78	12.13	10.99
47	13.25	12.57	11.94	10.84
48	13.01	12.36	11.74	10.68
49	12.76	12.14	11.54	10.51
50	12.51	11.92	11.34	10.35
51	12.26	11.69	11.13	10.17
52	12.00	11.45	10.92	9.99
53	11.73	11.20	10.70	9.82
54	11.46	10.95	10.47	9.63
55	11.18	10.69	10.24	9.44
56	10.9c	10.44	10.01	9.24
57	10.61	10.18	9.77	9.04
58	10.32	9.91	9.52	8.83
59	10.03	9.64	9.27	8.61
60	9.73	9.36	9.01	8.39
61	9.42	9 08	8.75	8.16
62	9.11	8.79	8.48	7.93
63	8.79	8.49	8.20	7.68
64	8 46	8.19	7.92	7.43
65	8.13	7.88	7.63	7.18
66	7.79	7.56	7.33	6.91
67	7.45	7.24	7.02	6.64
68	7.10	6.91	6.75	6.36
69	6.75	6.57	6.39	6 07
70	6.38	6.22	6.06	5.77
71	6.01	5.87	5.72	5.47
72	5.63	5.51	5.38	5.15
73	5.25	5.14	5.02	4.82
74	4.85	4.77	4.66	4.49
75	4.45	4.38	4.29	4.14
76	4.05	3.98	3.91	3.78
77	3.63	3.57	3.52	3.41
78	3.21	3.16	3.11	3.03
79	2.78	2.74	2.70	2.64
80	2.34	2.31	2.28	2.23

There are a great many uſeful queſtions, the determination of which depends on the value of annuities for lives, joint lives, ſucceſſive lives, *&c.* for which we refer to Mr. De Moivre's doctrine of chances and annuities for lives, and ſhall here only give the ſolution of a few, as being of moſt frequent uſe.

1. The values of two ſingle lives being given,

given, to find the value of an annuity granted for the time of their joint continuance; or, the value of two single lives being given, to find the value of the joint lives.

Multiply together the values of the two lives, and reserve the product. Let that product be again multiplied by the interest of 1 l. and let that new product be subtracted from the sum of the values of the lives, and reserve the remainder. Divide the first quantity reserved by the second, and the quotient will express the value of the two joint lives.

Thus, supposing one life of 40 years of age, the other of 50, and interest at 5 *per cent.* the value of the first life will be found in the tables to be 11.83; the value of the second 10.35; and the product will be 122.4405, which product must be reserved. Multiply this again by the interest of 1 l; that is, by 0.05, and this new product will be 6.122025; which being subtracted from the sum of the values of the lives, or 22.18, the remainder will be 16.057975, and this is the second quantity reserved. Now dividing the first quantity reserved by the second, the quotient will be 7.62 nearly; and this expresses the value of the two joint lives.

2. The values of two single lives being given, to find the value of an annuity upon the longest of them; that is, of an annuity to continue so long as either of them is in being.

From the sum of the values of the joint lives, subtract the value of the joint lives, and the remainder will be the value of the longest.

Suppose, for instance, two lives, one worth 13 years purchase, the other 14, and interest at 4 *per cent.* The sum of the values of the lives is 27; the value of the two joint lives, by the rule before given, is 9.23; and subtracting 9.23 from 27, the remainder 17.77 is the value of the longest of the two lives.

3. The values of three single lives being given, to find the value of an annuity upon the longest of them:

Take the sum of the three single lives, from which sum subtract the sum of all the joint lives combined two and two; then to the remainder add the value of the three joint lives, and the result will be the value of the longest of the three lives.

Thus, supposing the single lives to be 13, 14, and 15 years purchase, the sum of the values will be 42; the value of the first and second joint lives is 9.24; of the first and third, 9.65; of the second and third, 10.18; the sum of all which is 29.07; which being subtracted from the sum of the lives, that is, from 42, the remainder will be 12.93; to which adding the value of the three joint lives 7.41, the sum 20.34 will be the value of the longest of the three joint lives.

4. To find the present value of a remainder in fee, after a life of a given age. That is, supposing A to be in possession of an annuity for his life; and that B, after the decease of A, is to have the annuity for him and his heirs for ever, to find the present value of the remainder; or, as some call it, the reversion.

From the value of the fee simple, or perpetuity, subtract the value of the life in possession; what remains will be the present value of the reversion.

Thus, supposing that A is 60 years of age; an annuity upon his life, interest at 5 *per cent.* would be worth 8.39; which being subtracted from the value of the fee, or perpetuity 20, the remainder will be 11.61; which is the present value of the expectation of B.

By this rule, the value of an estate, subject to a jointure, may be determined.

In like manner, supposing that C were to have an annuity for him and his heirs for ever, after the lives of A and B; then from the perpetuity, or fee simple, subtracting the value of the longest of the two lives A and B, the remainder will express the value of C's expectation.

Thus, supposing the age of A to be 40, and that of B to be 50, the value of an annuity upon the longest of these two lives would be found, by the foregoing rules, to be 14 56; and this being subtracted from the perpetuity 20, the remainder is 5.44; which is the present value of C's expectation.

5. To find the value of an annuity for life, after another annuity for life.

Suppose, for instance, that A is in possession of an annuity for his life, and that B, after the death of A, is to have the annuity for his life only, and that his heir, or representative, is to have nothing in case A survives B; what is the value of the life of B after the life of A.

From the present value of the life of B, subtract the present value of the joint lives of B and A, and the remainder will be the value of B's expectation.

LIFFEY, a river of Ireland, which rifes in the county of Wicklow, and difcharges itfelf into Dublin-bay.

LIGAMENT, in anatomy, a ftrong compact fubftance, ferving to join two bones together.

A ligament is more flexible than a cartilage, not eafily ruptured or torn, and does not yield, or at leaft very little, when pulled.

Some ligaments are defigned to ftrengthen the joints, and to fecure the bones in their feveral motions from parting from each other, as happens in luxations; other ligaments ferve to connect cartilages with bones; and fome there are which ftrengthen other parts, befides the bones and cartilages; of this laft kind are the annular ligaments, fo called, not fo much from their figure as from their ufe, ferving, like a ring, to bridle the tendons of many mufcles. Some ligaments again are fixed to one or more bones, with different degrees of tenfion, and ferve on each fide for the infertion of mufcles. To thefe may be added, the ligaments commonly termed aponeurofes; fuch as thofe of the temples, fcapula, os humeri, ulna, palm of the hand, thigh, leg, and fole of the foot. Other differences of ligaments may be deduced from their confiftence, folidity, fituation and figure; fome are almoft cartilaginous, and others have a particular elafticity, by which they are capable of being drawn out by a fufficient force, and of contracting again when left to themfelves.

LIGATURE, in furgery, is a chord, band or ftring; or the binding any part of the body with a chord, band, fillet, &c. whether of leather, linnen, &c.

Ligatures are ufed to extend and replace bones that are broken or diflocated; to tie the patients down in lithotomy and amputations; to tie upon the veins in phlebotomy, or the arteries in amputations, or in large wounds; to fecure the fplints that are applied to fractures; to tie up the proceffes of the peritonæum, with the fpermatic veffels in caftration; and, laftly, in taking off warts or other excrefcences by ligature. For the manner of ufing them, fee LITHOTOMY, PHLEBOTOMY, FRACTURE, &c.

LIGHT, *lux*, in phyfiology, certain fubtile particles of matter, capable of exciting in us the fenfation of colours.

Light undoubtedly confifts of inconceivably fmall particles of matter, of different magnitudes; which are emitted or reflected from every point in the furface of a luminous body in right lines, and in all directions, with an unparalled velocity; and whofe power or intenfity decreafes as the fquares of the diftance increafe.

That light is a material fubftance, appears from its being propagated in time, and from its acting upon and producing great alterations in other bodies; but that its particles are inconceivably fmall appears from hence, that the greateft quantity of flame is found to have fcarce any fenfible gravity or weight: alfo becaufe thefe particles pervade the pores of all tranfparent bodies, however hard or heavy. Yet fmall as they are, we find the rays of light confift of different forts of thefe particles; and that this difference arifes from their different magnitudes, feems evident from the different directions the feveral forts of rays move in, after they have paffed through a body of glafs, water, &c. of fome fpecial figure, efpecially that of a prifm. See the article COLOUR.

The divine wifdom and providence appear, perhaps, in nothing fo remarkably as in the extreme fubtilty of the particles of light: without this qualification it could not have pervaded the pores of bodies, and fo we could have had none of thofe which we call diaphanous or tranfparent fubftances, and every thing but the furface of a body would have been concealed from the fight of mankind. Again, the velocity of a body is always as the quantity of matter inverfely; and, therefore, the fmaller the body, the greater velocity it is fufceptible of from the fame force; whence it comes to pafs that light is thus qualified to be tranfmitted through immenfe diftances in a fmall and infenfible part of time; which thing was quite neceffary, according to the prefent frame and ftate of nature.

But, laftly, it was abfolutely neceffary that the particles of light fhould be fo exceeding fmall, that, when compounded with its velocity, it fhould produce no fenfible force, as it muft otherwife have done, and which, therefore, could not have been borne by the tender and delicate texture of the feveral parts of vegetable and animal bodies. To give an example: the velocity of a particle of light is found to be at the rate of

897600000 feet *per* second; suppose its matter to be but one millionth part of a grain, then its force to strike an object would be as $\frac{897600000}{1000000} = 897,6$ feet *per* second for one grain; or it would strike with the same force that one grain weight would do falling from half the height, *viz.* through 448,8 feet; which we should find to be very great, was the experiment to be made on the sensible coats of the eye.

Since the weight of bodies is proportional to the quantity of matter, it follows, that, where the latter is diminished indefinitely, the former will be so too; therefore, the weight of light must be insensible to ever so great a quantity of it. Dr. Boerhaave caused a globe of iron, twelve inches in diameter, to be heated red-hot, and suspended at the end of a very exact ballance, and counterpoised by weights at the other end very nicely, and thus let it hang till all the particles of heat or light were escaped, when he found the equilibre of the ballance no ways altered; which plainly proves the above thesis. See the article FIRE.

That the particles of light have not only magnitude, but that in different degrees also, is another, and perhaps the most subtile, discovery of the Newtonian philosophy. The comparative terms of greater and lesser are now as applicable to the particles of light, as to any other bodies. This is absolutely proved by the different refrangibility they are found to have in passing through a prismatic figure of glass or water; for the power of the prism detains the issuing particle, and draws it a little towards the surface; and, since this power is the same, it would have the same effect on all the particles of light, if they were all of an equal magnitude, because they have all an equal velocity. But since this effect is different among the particles, some being detained and drawn aside to a greater distance than others, it follows, they must be less in magnitude, to become more subject to the influence of the attracting surface; in like manner as the electric effluvia will act upon and agitate very small and light bodies, much sooner and more easily than they can move those which are larger. But of this more when we come to speak of the manner in which this power acts in refracting the rays of light. See REFRACTION.

If light were not reflected from every point in the surface of a body in all directions every way, there might be assigned a point of space where a ray of light, from such a point in the surface, does not come; and there the said point of the surface could not be visible: but because the eye can find no point of space in all the visible hemisphere respecting that point, but where it is visible; therefore a ray of light is reflected from that point to every part of space, from whence a right line to that point can be drawn.

That the rays of light proceed in a right-lined direction, is evident from hence, that whatever the figure of the body be, if it be held perpendicular to the rays of light, it will always cast a shadow of the same figure against a parallel plane. Thus a circle will produce a circular shadow, a triangle a triangular one, and so on. Which plainly shews that the rays of light pass by the extremities of these bodies in right-lined directions, excepting these only which pass contiguous to the edges of the body; for they will be a little inflected, which will cause the extremity of the shadow to be not so distinct and well defined as it otherwise would be; of which we shall take farther notice hereafter.

As all the other affections of light, so that of its velocity was utterly unknown to all the antient, and most of the modern philosophers, who, before the time of Mr. Romer, were of opinion that the motion of light was instantaneous, or that it was propagated through immense spaces in an instant. But Mr. Romer, and other philosophers, about this time, making frequent observations on the eclipses of Jupiter's moons, found that the time of these eclipses did not correspond to the calculations founded upon the astronomical tables; where the times are all calculated for the distance of the center of the sun, and consequently where the eye of the spectator must be supposed to be in viewing the said eclipses, occultations, &c. of jupiter's moons.

To illustrate this matter, let S (plate CLVIII. fig. 2. n° 1.) be the center of the sun, A B the orbit of mercury, C D the orbit of venus, E F that of the earth, and G H a part of the orbit of jupiter. Let I be the body of jupiter, and K L its shadow; O M N the orbit of one of jupiter's moons, M just entering the shadow of jupiter. Now a spectator at S would

would obferve the moon M to enter the fhadow, juft at the time which is calculated from the tables: but a fpectator on the earth, at T, always obferves it to happen fooner; and, when the earth is in the oppofite part of its orbit R, he will always obferve it to happen later, by the fpace of about feven minutes, in both cafes. This obfervation gave the firft proof that light was progreffive, and took up about fourteen minutes to pafs over the diameter of the earth's orbit from T to R, or feven minutes to pafs from the fun S to the earth T.

But this, though a fufficient difcovery or proof of the progreffive motion of light, was yet but an experiment in the grofs, and not accurate to determine or define the true rate of velocity which properly belonged to light: the folution of this noble problem was referved for Dr. Bradley, who by reiterated and certain experiments, obferved, that the bright ftar in the head of draco appeared 39″ more northerly in September than in March, juft the contrary way to what it ought to appear by the annual parallax of the ftars, which muft arife from the velocity of light bearing fome proportion to that of the annual motion of the earth, and is called aberation of light. See STAR.

To illuftrate this, and from thence to determine the velocity of light: let A B (*ibid.* n° 2.) reprefent a part of the earth's annual orbit, and let C be a ftar obferved by a fpectator at the earth at A; when the earth arrives at B, the ftar will not be obferved at C, as before, but at D in the line B D parallel to A C; for let A B be divided into equal parts A *a*, *ab*, *b c*, *cd*, and *d*B; then through thefe points draw the lines *a e*, *bf*, *cg*, *dh*, parallel to A C and D B. Now let the velocity of the earth be to that of the light as A B to C B. When the earth fets out from the point A, fuppofe the ray of light commences its motion from the ftar at C in the direction C B perpendicular to A B; then it is plain, when the earth is arrived at *a*, the particle of light will be got to *i*, the point where *a e* cuts B C, and the ftar will be feen in the direction *a i* and appear at *e*. In like manner, when the earth is at *b*, the particle of light will become to *k*, and will appear at *f*, and fo on; when the earth is at *c*, *d*, B, the particle will be at *l*, *m*, and B, and the ftar will appear at *g*, *h*, and D. If therefore the line C A reprefents the axis of a telefcope, making the angle B A C with the direction of the earth's motion A B; when the fpectator comes to B, he will fee the ftar at D, which he could not do, if the telefcope was directed in the perpendicular line B C; but the difference of the pofitions of the lines D B and B C, or the angle D B C, is fo very fmall as to amount to no more than 20″ 15‴, which gives the proportion of the fides B C to C D or A B, as 10210 to 1; which fhews that the velocity of light is 10210 times greater than the velocity of the earth in her orbit. But the velocity of the earth is known, which is about 500,000,000 miles in 365 days, or about 56,000 miles *per* hour; whence the velocity of light will be found to be fuch as carries it through the fpace of 170,000 miles, or 897,600,000 feet in one fecond; and, therefore, it will pafs from the fun to us in 8′ and 13″.

If a cannon will throw a ball one mile perpendicular height, or 5280 feet, the velocity with which it goes from the cannon's mouth is the uniform velocity of 10,560 feet *per* 18¼″, (which is the time of the perpendicular afcent or defcent) and, therefore, the velocity of the cannon-ball is 578 feet *per* fecond. Whence the velocity of light is, to that of the cannon-ball, as 897,600,000 to 578, or as 1,550,000 to 1, nearly.

The doctor found that the parallax of the fixed ftars, inftead of amounting to many feconds, as fome have deduced from their obfervations, does not make one fecond; and from thence it follows that the abovementioned ftar, in draco, is about 400,000 times farther from us than the fun; and, confequently, that the light takes up above 493″ × 400,000 = 197,200,000 feconds (which is more than fix years) in coming from that ftar to us.

For the properties of reflected and refracted light, fee the articles REFLECTION and REFRACTION.

LIGHT, is alfo ufed to denote the difpofition of objects, with regard to the receiving of light: thus, the doors, windows, &c. of houfes, are called lights.

For the lights and fhades of paintings, &c. fee CLARO-OBSCURO.

LIGHT, in the menege, a term ufed in various fenfes: thus a light horfe, is a fwift runner: but the fame term is alfo given to a horfe that is well made, tho' he is neither fwift nor active; for we

here

here consider only the shape and make of the horse, without regard to his qualities. We call a coach-horse light, when he stirs nimbly and dreads the whip. In this sense, all light coach-horses are good; and a hard heavy coach-horse, that takes the lashing easily, is good for nothing. For light upon the hand, and light-horse, see HAND and HORSE.

LIGHT-HOUSE, in maritime affairs, a building on the sea-shore, a promontory, a rock, &c. wherein is kept a light, during the night, in order to direct vessels sailing near the place.

LIGHTENING, in physiology, the bursting of fire from a cloud.

From repeated experiments, it appears, that lightening is only electrical fire drawn off from the clouds: and, in effect, this electricity has been collected during thunder in iron-bars, or in tin-tubes, in many parts of Europe. See the article ELECTRICITY.

Thunder then, or lightening, is in the hand of nature, what electricity is in ours; the wonders which we now exhibit at pleasure, are only little imitations of those great effects which frighten us. A cloud prepared by the action of winds, by heat, by a mixture of exhalations, &c. is the electrised body; and watery clouds, or terrestrial matter, the non-electrics which excite it. See the article THUNDER.

The dreadful effects of lightening, as killing men and other animals, demolishing houses, splitting trees, &c. are too well known to be insisted on here. It has also been known to render iron magnetical, and to reverse the polarity of needles; and the same effects may be produced by electricity; and indeed, says the abbe Nollet, the universality of the electric matter, the readiness of its action, its inflammability, its property of striking bodies both externally and internally, even to their smallest parts, and of giving fire to them; all these points of analogy make it probable that lightening and electricity are owing to the same causes.

LIGHTER, in naval architecture, a large kind of boat, used in the river of Thames for carrying heavy goods, as coals, timber, &c.

LIGHTNESS, or LEVITY OF BODIES. See the article LEVITY.

LIGNICENSIS *terra*, in the materia medica, the name of a fine yellow bole, dug in many parts of Germany, particularly about Emeric in the circle of Westphalia, and used in cordial and astringent compositions. It is a common succedaneum for the yellow silesian bole, where that is not to be had, and is generally esteemed very nearly, if not absolutely, equal to it in its virtues. It is moderately heavy, naturally of a smooth surface, and of a beautiful gold-colour. It easily breaks between the fingers, and does not stain the skin in handling, and melts freely in the mouth, but generally leaves a little grittiness between the teeth. It makes no effervescence with acids; and burns not to a red, but to a pale brown, and almost to a stone hardness. Charlton says it is more frequently known by the name of terra sigillata golthergensis.

LIGULATED, among botanists, an appellation given to such floscules as have a straight end turned downwards, with three indentures, but not divided into segments. See plate CLVIII. fig. 4.

LIGUSTICUM, LOVAGE, in botany, a genus of the pentandria digynia class of plants, the general corolla of which is uniform, and the single flowers consist each of five lanceolated petals, bent inwards at the points: the fruit is naked, oblong, angulated, sulcated, and separable into two parts; and containing two oblong, smooth seeds, plain on one side, and striated on the other.

Under this genus are comprehended the siler, cicutaria, and levisticum of authors.

The root and seeds of lovage are accounted carminative, aromatic, and sudorific; and prescribed with success in malignant fevers, colics, apoplexies, and disorders of the head.

LIGUSTRUM, PRIVET, in botany, a genus of trees, belonging to the diandria monogynia class of plants, with a funnel-fashioned flower, quadrifid or quinquifid at the limb: the fruit is a globose, smooth berry, with only one cell, containing four seeds convex on one side, and angulated on the other. See plate CLVIII. fig. 5.

Privet leaves and seeds are esteemed cooling, drying, and astringent; and therefore recommended in putrid disorders of the gums, inflammations, and the like.

LIKE, in geometry, &c. denotes the same as similar. See the article SIMILAR.

LILIACEOUS, an appellation given to such flowers, as resemble that of the lily. See the article LILY.

LILIUM, the lily. See the next article.

LILY, LILIUM, in botany, a genus of the

the hexandria monogynia clafs of plants, with a campanulated flower, rifing narrow out of the cup, and expanding towards the limb: it confifts of fix erect petals, obtufe at the points, which are bent backwards: the fruit is an oblong capfule, with three cells, in which are contained a great many fmall feeds. See plate CLVIII. fig. 3.

White lily-roots are emollient, and fuppurative; being ufed with fuccefs in cataplafms, intended for thefe purpofes. The flowers are alfo emollient and anodyne. They are only ufed externally, and that either in the form of a cataplafm, or of an oil by infolation.

LIMA, a province of Peru, in South America; the capital of which, called alfo Lima, was almoft entirely deftroyed by an earthquake, in 1746: weft long. 76°, and fouth lat. 12° 30′.

LIMALE, a town of Brabant, thirteen miles fouth-weft of Bruffels.

LIMAX, the fnail, in zoology, the animal that inhabits the murex-fhell. See the articles SNAIL and MUREX.

LIMB, in a general fenfe, denotes the border or edge of a thing: thus, we fay, the limb of a quadrant, of the fun, of a leaf, *&c.*

LIMB, in anatomy, an appellation given to the extremities of the body, as the arms and legs. See ARM and LEG.

LIMB, *limbus*, in the church of Rome, is ufed in two different fenfes. 1. The limb of the patriarchs is faid to be the place, where the patriarchs waited the redemption of mankind: in this place, they fuppofe our Saviour's foul continued from the time of his death to his refurrection. 2. The limb of infants, dying without baptifm; a place fuppofed to be diftinct both from heaven and hell; fince, fay they, children dying innocent of any actual fin do not deferve hell; and by reafon of their original fin cannot be admitted into heaven.

LIMBER-HOLES, little holes cut thro' the floor-timbers of a fhip, ferving to convey the bildge-water to the pump.

LIMBURG, the capital of a dutchy of the fame name, in the Auftrian Netherlands, twenty miles fouth-eaft of Liege: eaft long. 6° 5′, and north lat. 50° 37′.

LIME, *calx*, a foft, friable, fubftance obtained by calcining or burning ftones, fhells and the like.

There are fo many fpecies of ftone capable of being burnt into lime, and fo many that in the different parts of the world are really put to that ufe, that it would be difficult to affix any particular idea to the term lime-ftone; but we are to underftand by it in general, any ftone, that upon a proper degree of heat continued a fufficient time, becomes a white calx, which will make a great ebullition and noife on being thown into water, and will, in fine, fall into a loofe white powder at the bottom of that liquor; after having very ftrongly impregnated it with its foluble particles. The moft common kind of lime-ftone, is a greyifh or bluifh ftone, found in loofe maffes, and often veined with red: marble, alabafter, and all the ftones that have fpar for their bafis, may alfo come under the general denomination of lime-ftone, fince they all burn into lime. In general, every ftone, of whatever kind or colour, that will ferment with aqua fortis, will alfo burn into lime, and it is of no confequence to the medicinal ufe of that calx, whether it be made of the one or the other of thefe ftones. What lime we have in London is made of chalk, which is weaker than that made of ftone; but it is otherwife the fame.

The kilns ufed for making lime, are commonly built in a large pit; they are wide at the top, and grow narrow by degrees, as they approach nearer to the bottom: on the outfide, near the bottom of the kiln, there is door, at which the afhes are taken out, and juft above that an iron-grate: upon this is placed a layer of ftone, or whatever elfe is to be burnt for making lime, and upon that a layer of wood or coals, which is repeated till the kiln is full, only obferving, that the outmoft layer muft be wood or coals. Chalk is commonly burnt in twenty-four hours, but ftone often takes up fixty hours: ten bufhels of fea-coal, or a hundred of faggots three feet long, will burn forty bufhels of chalk, and forty bufhels of chalk will yield thirty bufhels of unflacked lime.

The beft lime is that made of the hardeft ftone; it is not only ufed by architects, builders, plafterers, dyers, fugar-refiners, tanners, and many other mechanics, but is an excellent manure for land, where it is fandy, or a mixed gravel; but it is not fit for a cold gravel or clay foil. In many places it is carried out and laid in heaps, allowing a bufhel to a pole-fquare, or a hundred and fixty bufhels to an acre. The beft method of ordering it, is to mix it with dung, mud, or frefh

fresh earth, and to spread it to over the earth the year before it is plowed.

Lime is also of great service in medicine, for which use, it is to be chosen in clean, light, and hard pieces, but not stony, such as will not easily crumble to pieces between the fingers, and yet will readily break when thrown into water. The best lime in the world, on being long exposed to a damp air, will moulder into a powder, and lose all its medicinal virtues. Lime in its perfect and unaltered state, as newly taken from the kiln, is called calx viva, or quick-lime: that which has lain in the air till it has fallen into powder, is called calx extincta; and that which has been thrown into water, and the powder it has fallen into afterwards washed with several fresh waters, is called calx lota.

Quick-lime is burning and corrosive, and is never given internally; but it is sometimes used in external applications, as made into a paste with orpiment, soap, &c. and used as a depillatory. The calx lota is no longer a corrosive, but a powerful deficcative; and lime-water is of great service internally in all cutaneous eruptions, in the cure of obstinate ulcers, and for diseases of the lungs: for this purpose it is generally to be continued a considerable time.

The preparations of lime in use in the shops are, the simple lime-water; the less compound lime-water; the more compound lime-water; and several kinds of caustics, which see under the article CAUSTIC.

Simple lime-water is made in the following manner: Put a pound of quick lime into a large earthen-pan; pour upon it, by a little at a time, a gallon and a half of water; after the ebullition is thoroughly over, let the liquor stand to settle, and then pour it clear off, and filter it for use. This is principally intended for washing old ulcers, and other external purposes; when it is to be taken internally, the following additions are made to it, to take off its flavour, or to add to its virtues. Take of liquorice-root, an ounce; of sassafras-bark, half an ounce; simple lime-water, three quarts; let the whole infuse together for two days without heat, then filter it for use: this last preparation is called the less compound lime-water. The more compound lime-water is made thus: Take raspings of guaiacum, half a pound; liquorice-root, an ounce; sassafras-bark, half an ounce; of coriander-seed, three drams; of lime-water three quarts; let the whole stand together two days without heat, and then filter it off for use.

It has been found by several late experiments, made by Dr. Alston, that lime-water is an excellent remedy for the stone; and that it has also been given with extraordinary success in acute fevers. Sponius says, that when drank with milk or whey, it performs wonderful effects in internal ulcers, diarrhœas, and the dysentery.

Lime-water on being mixed with linseed-oil, or the oil of olives, and well shaken, acquires the consistence of a balsam, which is of a singular service when applied externally in fresh burns, and also conduces to stop inflammations. It may also be impregnated with copper, by standing in a brazen bason: by which means it assumes a beautiful saphire colour, and proves an excellent remedy against pustules, ulcers, scabies, and itching of the eyes; and this last preparation mixed with a little sal ammoniac, is recommended against all humours, films, and other blemishes of the eyes, and is said to be very efficacious when the eyes are hurt by the small-pox; and there is no remedy more effectual for cancerous ulcers.

Bird-LIME. See the article BIRD-LIME.

LIME-PHOSPHORUS. See PHOSPHORUS.

LIME TREE, the english name of the tilia. See the article TILIA.

LIMERIC, the capital of a county of the same name in Ireland, situated on the river Shannon, fifty-two miles north of Cork: west long. 8° 30′, north lat. 52° 35′.

LIMINGTON, or LEMINGTON, a borough town of Hampshire, twelve miles south west of Southampton. It sends two members to parliament.

LIMIT, in a restrained sense, is used by mathematicians for a determinate quantity to which a variable one continually approaches; in which sense, the circle may be said to be the limit of its circumscribed and inscribed polygons. In algebra, the term limits is applied to two quantities, one of which is greater, and the other less, than another quantity; and in this sense it is used, in speaking of the limits of equations, whereby their solution is much facilitated.

Let any equation, as $x^3 - p x^2 \times q x - r = 0$ be proposed; and transform it into the

the following equation. See the article TRANSFORMATION.

$$\left.\begin{array}{r} y^3+3ey^2+3e^2y+e^3 \\ -py^2-2pey-pe^2 \\ +qy+qe \\ -r \end{array}\right\} = 0.$$

Where the values of y are lefs than the refpective values of x, by the difference e. If you fuppofe e to be taken fuch as to make all the coefficients of the equation of y pofitive, *viz.* e^3-pe^2+qe-r, $3e^2-2pe+q$, $3e-p$; then there being no variation of the figns in the equation, all the valves of y muft be negative; and confequently the quantity e, by which the valves of x are diminifhed, muft be greater than the greateft pofitive value of x: And, confequently, muft be the limit of the roots of the equation $x^3-px^2+qx-r=0$.

It is fufficient therefore, in order to find the limit, to enquire what quantity fubftituted for x, in each of thefe expreffions x^3-px^2+qx-r, $3x^2-2px+q$, $3x-p$, will give them all pofitive; for the quantity will be the limit required.

Having found the limit that furpaffes the greateft pofitive root, call it m. And if you affume $y=m-x$, and for x fubftitute $m-y$, the equation that will arife will have all its roots pofitive; becaufe m is fuppofed to furpafs all the values of x, and confequently $m-x$ $(=y)$ muft always be affirmative. And, by this means, any equation may be changed into one that fhall have all its roots affirmative.

Or, if $-n$ reprefent the limit of the negative roots, then by affuming $y=x+n$ the propofed equation fhall be transformed into one that fhall have all its roots affirmative; for $+n$ being greater than any negative value of x, it follows that $y=x+n$ muft be always pofitive.

What is here faid of the above cubic equation, may be eafily applied to others; and of all fuch equations, two limits are eafily difcovered, *viz.* o, which is lefs than the leaft; and e, found as above, which furpaffes the greateft root of the equation. But befides thefe, other limits ftill nearer the roots may be found; for the method of doing which, the reader may confult Maclaurin's Algebra, p. 175, feq.

LIMITS *of a planet*, its greateft excurfion from the ecliptic, or, which is the fame thing the points of its greateft latitude.

LIMITATION, in law, fignifies a certain fpace of time allowed for bringing actions in. Thus by the ftatute of the 21 Jac. I. c. 16. it is ordained, that all writs of formedon, &c. for title to lands in being, muft be fued out within twenty years after the title arofe, and actions of debt upon the cafe, actions upon a ftated account, of detinue, trover and trefpafs, muft be commenced within fix years after the caufe of action, and not afterwards: actions of affault and battery muft be brought within four years after the caufe of action; and for flander, within two years. Though an action may be barred by ftatute, yet a frefh promife will revive it. It is faid, that twenty years poffeffion of land is a good title in a perfon to maintain an action of ejectment, though he be not at that time actually poffeffed thereof: but where the plaintiff is out of poffeffion more than fuch a number of years, it will bar him the ftatute. See PRESCRIPTION.

LIMITATION OF ESTATE, is the length of time an eftate is to continue in the poffeffion of a perfon or family. As where a perfon grants lands to a perfon and his heirs male, and on default of fuch iffue, to his heirs female; here the daughters cannot inherit fo long as there is a male heir, becaufe the eftate is firft limited to the heirs male.

LIMITED PROBLEM, a problem that admits but of one folution, as to make a circle pafs through three given points, not lying in the fame right line. See the article PROBLEM.

LIMMA, in mufic, an interval in the fcale of the antients, expreffed by $\frac{256}{243}$. See the article INTERVAL.

LIMNING, the art of painting in water-colours, in contradiftinction to painting, which is done in oil-colours. See the article PAINTING.

Limning is by far more antient than painting in oil; this laft being firft invented by John Van Eyck, a flemifh painter, in 1410.

In limning, all colours are proper enough, except the white, made of lime, which is only ufed in frefco. The azure and ultramarine muft always be mixt with fize or gum: but there are always applied two lays of hot fize, before the fize colours are laid on: the colours are all ground in water, each by itfelf, and as they are required in working, are diluted with fize-water.

When the piece is finifhed, they go over it with the white of an egg, well beaten, and then with varnifh, if required.

To

To limn or draw a face in colours: having all the materials in readineſs, lay the prepared colour on the card even and thin, free from hairs and ſpots, over the place where the picture is to be. The ground being laid and the party placed in a due poſition, begin the work, which is to be done at three ſittings; at the firſt, you are only to dead colour the face, which will require about two hours. At the ſecond ſitting, go over the work more curiouſly, adding its particular graces or deformities. At the third ſitting, finiſh the whole; carefully remarking whatever may conduce to render the piece perfect, as the caſt of the eyes, moles, ſcars, geſtures, and the like.

LIMODORUM, in botany, a genus of the gynandria-diandria claſs of plants, the flower of which conſiſts of five oblong petals, and the nectarium hollow, and formed of a ſingle leaf: the fruit is a columnar unilocular capſule, containing a great number of very ſmall ſeeds.

LIMOGES, a city of France, a hundred miles north-eaſt of Bourdeaux.

LIMON, the LEMON TREE, is made by Linnæus a ſpecies of citrus. See CITRUS.

LIMOSELLA, in botany, a genus of the didynamia-angioſpermia claſs of plants, the flower of which conſiſts of one erect petal, divided into five ſegments; and its fruit is an unilocular capſule, containing a great many ſeeds.

LIMPET, the engliſh name of a ſhell-fiſh, called by authors patella. See PATELLA.

LINARIA, the LINNET in ornithology. See the article LINNET.

LINCOLN, the capital city of the county of Lincoln: weſt long. 27′, north lat. 53° 16′. It ſends two members to parliament.

LINDSEY, the north diviſion of Lincolnſhire.

LINE, *linea*, in geometry, a quantity extended in length only, without any breadth or thickneſs. It is formed by the flux or motion of a point. See FLUXION. There are two kinds of lines, *viz.* right lines and curve lines. If the point A, (pl. CLVIII. fig. 6. n° 1.) move towards B; by its motion, it deſcribes a line, and this, if the point go the neareſt way towards B, will be a right or ſtraight line, whoſe diſtinction therefore is the neareſt or ſhorteſt diſtance between any two points; or a line, all whoſe points tend the ſame way. If the point go any way about, as in one of the lines A B C, or A *c* B, it will trace out either a crooked line, as the upper A *c* B, or elſe two more ſtraight ones, as in the lower A C B. Right lines are all of the ſame ſpecies, but curves are of an infinite number of different ſpecies. We may conceive as many as there may be different ratios between their ordinates and abſciſſes. See the articles ACSCISS and ORDINATE.

Curve lines are uſually divided into geometrical and mechanical; the former are thoſe which may be found exactly in all their points; the latter are thoſe, ſome or all of whoſe points are not to be found preciſely, but only tentatively, or nearly. Curve lines are alſo divided into the firſt order, ſecond order, third order, &c. See the article CURVE.

Lines conſidered as to their poſitions, are either parallel, perpendicular, or oblique, the conſtruction and properties whereof ſee under PARALLEL, &c.

Euclid's ſecond book treats moſtly of lines, and of the effects of their being divided and again multiplied into one another.

LINE, in geography, the ſame with equator. See the article EQUATOR.

LINES in aſtronomy, are, 1. Fiducial line, the line or ruler which paſſes thro' the middle of an aſtrolabe, or the like inſtrument, and on which the ſights are fitted, otherwiſe, called alhidade, index, dioptra, and medeclinium. See the article ASTROLABE. 2. The horizontal line. 3. Iſochronal line. 4. Meridian line. 5. Line of the nodes. See the articles HORIZONTAL, ISOCHRONAL, MERIDIAN and NODES.

LINES in perſpective, are, 1. Geometrical line, which is a right line drawn in any manner on the geometrical plane. 2. Terreſtrial line, or fundamental line, is a right line wherein the geometrical plane, and that of the picture or draught interſect one another, ſuch is the line N I, (plate *ibid.* n° 2.) formed by the interſection of the geometrical plane L M, and the perſpective plane H K. 3. Line of the front, is any right line parrallel to the terreſtrial line. 4. Vertical line, the common ſection of the vertical and of the draught. 5. Viſual line, the line or ray imagined to paſs from the object to the eye. 6. Line of ſtation, according to ſome writers, is the common ſection of the vertical and geometrical planes. Others, as Lamy, mean by it the perpendicular height of the eye above the geometrical plane. Others a line on that plane, and perpendicular to the line ex-

preffing the height of the eye. 7. Objective line, the line of an object from whence the appearance is fought for in the draught or picture.

LINE *of diftance*. See the article DISTANCE.

LINES, in dialling, are, 1. Horizontal line, the common fection of the horizon and the dial-plane. See DIAL. 2. Horary lines, or hour-lines, the common interfections of the hour-circles of the fphere, with the plane of the dial. See HORARY. 3. Subftylar line, that line on which the ftyle or cock of a dial is duly erected, and the reprefentation of fuch an hour-circle as is perpendicular to the plane of that dial. 4. Equinoctial line, the common interfection of the equinoctial and plane of the dial.

Contingent LINE. See CONTINGENT.

LINE *of meafures*, is ufed by Oughtred, to denote the diameter of the primitive circle in the projection of the fphere in plano, or that line in which the diameter of any circle to be projected falls. In the ftereographic projection of the fphere in plano the line of meafures is that line in which the plane of a great circle perpendicular to the plane of the projection, and that oblique circle which is to be projected, interfects the plane of the projection; or it is the common fection of a plane paffing through the eye-point and the center of the primitive at right angles to any oblique circle which is to be projected, and in which the center and pole of fuch circle will be found.

LINE *of direction* on the earth's axis, in the pythagorean fyftem of aftronomy, the line connecting the two poles of the ecliptic and of the equator when they are projected on the plane of the former.

LINE *of direction*, in mechanics, that wherein a body actually moves, or would move, if it were not hindered. It alfo denotes the line that paffes thro' the center of gravity of the heavy body to the center of the earth, which muft alfo pafs thro' the fulcrum, or fupport of the heavy body, without which it would fall.

LINE *of gravitation*, of any heavy body, a line drawn through its center of gravity, and according to which it tends downwards.

LINE *of the fwifteft defcent*, of a heavy body is the cycloid. See CYCLOID.

LINE *of a projectile*. See PROJECTILES.

LINES *on the plain fcale*, are the line of chords, line of fines, line of tangents, line of fecants, line of femitangents, line of leagues; the conftruction and application of which fee under the words SCALE, SAILING, &c.

LINES *on Gunter's fcale*, are the line of numbers, line of artificial fines, line of artificial tangents, line of artificial verfed fines, line of artificial fines of rhumbs, line of a artificial tangents of the meridian line, and line of equal parts; for the conftruction and application whereof, fee GUNTER'S SCALE.

LINES *of the fector*, are the line of equal parts, or line of lines, line of chords, line of fines, line of tangents, line of fecants, line of polygons, line of numbers, line of hours, line of latitudes, line of meridians, line of metals, line of folids, line of planes; for the conftruction and ufe whereof, fee the article SECTOR.

LINES, in fortification, are thofe of approach, capital, defence, circumvallation, contravallation, of the bafe, &c. See the articles APPROACH, &c.

To LINE *a work*, fignifies to ftrengthen a rampart with a firm wall; or to encompafs a parapet or moat with good turf, &c.

LINE, in the art of war, is underftood of the difpofition of an army, ranged in order of battle, with the front extended as far as may be, that it may not be flanked. See the article ARMY.

LINE *of battle*, is alfo underftood of the difpofition of a fleet on the day of engagement, on which occafion the veffels are ufually drawn up as much as poffible in a ftraight line, as well to gain and keep the advantage of the wind, as to run the fame board.

Ship of the LINE, a veffel large enough to be drawn up in the line, and to have a place in a fea-fight. See the article SHIP.

LINE, in fencing, that part of the body oppofite to the enemy, wherein the fhoulders, the right arm, and the fword, ought always to be found; and wherein are alfo to be placed the two feet at the diftance of eighteen inches from each other. In which fenfe a man is faid to be in his line, or to go out of his line, &c.

LINE *of demarcation*, or *Alexandrian* LINE, a meridian paffing over the mouth of the river Moragnon, and by the capes Houmas and Mallabrigo, fo called from pope Alexander VI. who, to end the difpute between the crowns of Caftile and Portugal, about their boundaries, drew an imaginary line on the globe, which was to terminate the pretenfions of each. By this partition, the Eaft-Indies fell to the fhare of the Portuguefe, and the Weft-Indies to the Caftilians.

LINE *of the Synodical*, in reference to ſome theories of the moon, is a right line ſuppoſed to be drawn through the centers of the earth and ſun: and, if it be produced, quite through the orbits: it is called the *line of the true ſyzygies*: but a right line imagined to paſs through the earth's center, and the mean place of the ſun, is called the *line of the mean ſyzygies*.

LINE, in genealogy, a ſeries or ſucceſſion of relations in various degrees, all deſcending from the ſame common father.

Direct line, is that which goes from father to ſon; being the order of aſcendants and deſcendants.

Collateral line, is the order of thoſe who deſcend from ſome common father related to the former, but out of the line of aſcendants and deſcendants: in this are placed uncles, aunts, couſins, nephews, &c. See DIRECT and COLLATERAL.

LINE alſo denotes a french meaſure, containing the twelfth part of an inch, or the hundred and forty-fourth part of a foot. Geometricians conceive the line ſubdivided into ſix points. The french line anſwers to the engliſh barley-corn. See the articles FOOT, INCH, &c.

LINES, in muſic, the name of thoſe ſtrokes drawn horizontally on a piece of paper, on and between which the characters and notes of muſic are diſpoſed: their number is commonly five; when another is added, for one, two, or more notes, it is called a ledger-line.

LINES, in heraldry, the figures uſed in armories, to divide the ſhield into different parts, and to compoſe different figures. Theſe lines, according to their different forms and names, give denomination to the pieces or figures which they form, except the ſtraight or plain lines.

LINES, among fowlers, is uſed to expreſs the things by which they catch birds.

LINEA ALBA, in anatomy, the concourſe of the tendons of the muſcles of the abdomen, extending from the ſternum to the juncture of the oſſa pubis, in form of a broad and ſtrong white ſtreak, and dividing the abdomen into two. See the article ABDOMEN.

LINEAMENT, among painters, is uſed for the out-lines of a face. See the article CONTOUR.

LINEAR NUMBERS, in mathematics, ſuch as have relation to length only; ſuch is a number which repreſents one ſide of a plane figure. If the plane figure be a ſquare, the linear number is called a root.

LINEAR PROBLEM, that which may be ſolved geometrically, by the interſection of two right lines. This is called a ſimple problem, and is capable but of one ſolution.

LINEN, or LINNEN. See LINNEN.

LING, in ichthyology, the cirrated gadus with two back-fins, and with the upper jaw longeſt; a fiſh called by authors aſellus longus. See the article GADUS.

LINGEN, a town of Germany, in the circle of Weſtphalia, capital of a county of the ſame name, ſituated on the river Ems, forty-five miles north of Munſter.

LINGUATULA, in ichthyology, a ſpecies of pleuronectes. See the article PLEURONECTES.

LINIMENT, *linimentum*, in pharmacy, a compoſition of a conſiſtence ſomewhat thinner than an unguent, and thicker than an oil, uſed for anointing different parts of the body in various intentions.

The materials proper for compoſing of a liniment, are oils, fats, balſams, and whatever enters the compoſition of unguents and plaſters.

The beſt way of uſing liniments, is to apply them after the pores have been opened by frictions or fomentations.

There are many ſorts of liniments directed in pharmaceutical writers; but we ſhall content ourſelves with giving that called linimentum Arcæi, prepared as follows: take of gum elemi, and turpentine of fir, of each an ounce and half; of old and depurated mutton-ſuet, two ounces; of old and depurated hog's lard, an ounce: mix them, and make an ointment.

Oils, unguents, and the fat of animals, or whatever any part is anointed with, are comprehended under the name liniment.

LINLITHGOW, a town of Scotland, in the county of Lothian, capital of the territory of Linlithgow, ſituated ſixteen miles weſt of Edinburgh.

LINNÆA, in botany, a genus of the didynamia-angioſpermia claſs of plants, the corolla of which is monopetalous, turbinated, ſemi-quinquifid, obtuſe, almoſt equal, and greater than double the cup of the flower; the fruit is a roundiſh bilocular berry; the ſeeds are ſolitary and roundiſh.

LINNEN, in commerce, a well known kind of cloth, chiefly made of flax. See FLAX.

In order to ſucceed in the linen-manufacture, one ſet of people ſhould be confined to the plowing and preparing the ſoil, ſowing and covering the ſeed, to the

weeding, pulling, rippling, taking care of the new feed, and watering and graffing the flax, till it is lodged at home: others should be concerned in the drying, breaking, scrutching, and heckling the flax, to fit it for the spinners; and others in spinning and reeling it, to fit it for the weaver; others should be concerned in taking due care of the weaving, bleaching, beetling, and finishing the cloth for the market. It is reasonable to believe, that if these several branches of the manufacture were carried on by distinct dealers in Scotland and Ireland, where our home-made linnens are manufactured, the several parts would be better executed, and the whole would be afforded cheaper, and with greater profit. But without entering farther into the nature of this manufacture, we shall content ourselves with giving the bounty on british and irish linnens exported, and the duties on those imported from foreign countries; only first observing that the use of all french cambrics and lawns is prohibited in Great Britain, but may be imported upon the importer's making oath that they are intended for exportation only, and giving a bond for the payment of 5 l. for every piece of cambric that shall not be exported within the term of three years after being entered. The use of callicoes, printed, painted, stained, and dyed, and brought from India, Persia, and China, is also prohibited; these are to be brought to no port but that of London, where they are to be duly entered, and secured in warehouses, till their exportation.

The exporter of british and irish linnens, that are neither striped, chequered, nor made into buckram, who sends them to Africa, America, Spain, Portugal, Gibraltar, or Minorca, shall be allowed $\frac{1}{2}$ d. for every yard of linnen under the value of 5 d. *per* yard; and $1\frac{1}{2}$ d. for every yard of the value of 5 d. and not exceeding the value of 1 s. 6 d.

The principal duties on foreign linnen imported, pay as follow: holland damask tabling of the breadth of two ells, and under three ells, pay, on being imported, 5 s. $\frac{60\frac{1}{2}}{100}$ d. the yard; and draw back on exportation 4 s. $6\frac{90\frac{1}{2}}{100}$ d. Ditto, of the breadth of three ells or upwards, pay on importation 7 s. $10\frac{35\frac{1}{2}}{100}$ d. the yard, and draw back on exportation 7 s. $4\frac{65\frac{1}{2}}{100}$ d. Holland diaper, of the breadth of two ells, and under three ells, pay on importation 2 s. $3\frac{27\frac{1}{4}}{100}$ d. the yard, and draw back on exportation 2 s. $\frac{70\frac{1}{4}}{100}$ d. D°, of the breadth of three ells, or upwards, pay on importation 3 s. $6\frac{46}{100}$ d. the yard and draw back on exportation 3 s. $3\frac{89\frac{1}{2}}{100}$ d. Holland diaper napkins, the dozen, pay on importation 6 s. $6\frac{71\frac{2}{5}}{100}$ d. and draw back on exportation 5 s. $8\frac{45\frac{2}{5}}{100}$ d. Holland diaper towelling and napkining, not exceeding an ell and $\frac{1}{8}$ in breadth, pay on importation $6\frac{56}{100}$ d. the yard; and draw back on exportation $5\frac{70\frac{1}{2}}{100}$ d. Silesia diaper towelling and napkining, pay on importation $3\frac{47\frac{4}{5}}{100}$ d. the yard; and draw back on exportation $3\frac{9\frac{4}{5}}{100}$ d. Bag, brabant, and brown holland, embden, flemish, frieze, gentish, isingham, overyssel, and rouse-cloth, not exceeding $1\frac{1}{8}$ ell english in breadth, pay on importation $10\frac{93\frac{1}{4}}{100}$ d. the ell, and draw back on exportation $9\frac{50\frac{3}{4}}{100}$ d. Ditto, above $1\frac{1}{8}$ ell and under two ells, pay on importation 1 s. $1\frac{4\frac{1}{5}}{100}$ d. the ell; and draw back on exportation $11\frac{61\frac{3}{5}}{100}$ d. Ditto, of the breadth of two ells, and under three ells, pay on importation 1 s. $3\frac{15\frac{1}{8}}{100}$ d. the ell; and draw back on exportation 1 s. $1\frac{72\frac{7}{8}}{100}$ d. Ditto, of the breadth of three ells or upwards, pay on importation 1 s. $11\frac{58\frac{7}{8}}{100}$ d. the ell; and draw back on exportation 1 s. $10\frac{16\frac{3}{8}}{100}$ d. Hamburgh and silesia-cloth, broad, the hundred ells, containing six score, pay on importation 2 l. 3 s. $5\frac{67\frac{1}{2}}{100}$ d. and draw back on exportation 1 l. 18 s.

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$8\frac{67\frac{1}{2}}{100}$d. Ditto, narrow, pay on importation 1 l. 14 s. $9\frac{34}{100}$d. and draw back on exportation 1 l. 10 s. $11\frac{74}{100}$d. Lawns the piece, containing thirteen ells, 1 l. 1 s. $10\frac{38}{100}$d. and draw back on exportation 19 s. $\frac{18}{100}$d. Silesia-lawns, the piece, containing between four and eight yards, 2 s. $2\frac{\frac{3}{8}8}{100}$d. and draw back on exportation 1 s. $11\frac{23\frac{3}{8}}{100}$d. All linen made in Germany and Poland, as narrow-silesia, narrow-westphalia, &c. plain napkining, and all other narrow cloth made in these countries, not otherwise rated, pay, upon importation, the hundred and twenty ells, 17 s. $4\frac{67}{100}$d. and draw back on exportation 15 s. $5\frac{87}{100}$d. And besides the above duties, all linnens, chequered, striped, printed, painted, stained, or dyed (except lawns, striped or chequered linens, being all white, silesia-neckcloths striped at the ends only, barras or packing canvas, and buckrams) pay on importation, for every 20 s. value on oath, 6 s. which is returned on exportation.

LINNET, *linaria*, in ornithology, a bird of the size of the goldfinch; the head is small and flatted; the eyes are small, and hazel; the beak is conic, very small, and sharp at the point; the head, neck, and back are variegated with a bright brown and white; the breast and belly are pale, but in the male, especially in the summer, there is a redness on the top of the head and all over the breast. This is a singing bird, and sometimes has young ones four times a year, especially if they are taken from the dam before they are able to fly, which may be done four days after they are hatched. See plate CLIX. fig. 1. which represents the cock and hen, with an egg.

LINSEED, the seed of the plant linum. Linseed bruised and steeped in water, gives it very soon a thick mucilaginous nature, and communicates much of its emollient virtues to it. It is anodyne, attemperating, and of great service in suppressions of urine from inflammation and heat; it invelops the acid salts of the urine, and prevents their vellicating and wounding the tender parts; and in some measure supplies the mucus of the bladder, when abraded and worn off. It is to be given in decoction or infusion, on these occasions; the infusion is not to be made too thick or mucilaginous, because in that case it loads the stomach and breeds flatulencies in the intestines. A slight infusion of linseed, by way of tea, is recommended by many as an excellent pectoral; and the seed is a common and very good ingredient in clysters. Externally, this seed, ground to powder, is an excellent emollient; as is also the strong mucilage, made by boiling the seeds a long time: the oil drawn from it by expression, is of great service in coughs, pleurisies, and many other cases.

LINSPINS, in the military art, small pins of iron, which keep the wheel of a cannon, or waggon, on the axletree; for when the end of the axletree is put thro' the nave, the linspin is put in, to keep the wheel from falling off.

LINSTOCK, in the military art, a wooden staff, about three feet long, upon one end of which is a piece of iron, which divides in two, turning from one another, having each a place to receive match, and a screw to keep it fast: the other end is pointed, and shod with iron, to stick in the ground. It is used by gunners, to fire the guns.

LINT, *linum*, from the flax of which linnen is made. See FLAX and LINNEN.

In surgery, the term lint denotes the scrapings of linnen which is used in dressing wounds, and is made up in various forms, as tents, dossils, pledgets. &c. See the articles TENT, DOSSIL, &c.

LINTEL, in architecture, a piece of timber that lies horizontally over door posts and window-jambs, as well to bear the thickness of the wall over it, as to bind the sides of the wall together.

LINTON, a market-town of Cambridgeshire, situated ten miles south-east of Cambridge.

LINTS, or LINTZ, a beautiful city, capital of Upper Austria, with a strong citadel.

LINUM, FLAX, in botany, a genus of the pentandria-pentagynia class of plants, the flower of which is infundibuliform, consisting of five oblong petals; its fruit is a globose capsule, divided into ten cells, in each of which is a single acuminated seed. See the articles FLAX and LINSEED.

LION, *leo*, in zoology, the strongest and fiercest of all quadrupeds: it is a species of felis, with an elongated floccose tail, and a mane on the neck; and is larger in size than the biggest mastiff: its head is large, and the breast broad, in propor-

tion

tion to the other parts; the legs are alfo very thick and ftrong, and its claws of a furprifing length and thicknefs: the fur of the whole body is of a tawney yellow colour. The lionefs is, in all refpects, like the lion, except that fhe wants the mane; but this makes fo great a difference in her appearance, that fhe feems a creature of a different genus. See plate CLIX. fig. 2. which reprefents a lion, called Marco, in the tower of London; alfo a lionefs, lying upon the ground.

LIONCELLES, in heraldry, a term ufed for feveral lions born in the fame coat of arms.

LIP, *labium*, or *labrum*, in anatomy, the exterior flefhy covering of the mouth. See the article MOUTH.

The lips are two in number, an upper and under. They are compofed principally of mufcles, and are covered externally with the general integuments, and internally with the membrane of the mouth: under this membrane there is in both lips, a great number of miliary and lenticular glands. The prolabia, when the epidermis is taken off, after macerating a fufficient time in water, are found alfo to have a multitude of nervous papillæ; and hence it is that they are fo extremely fenfible. Each of the lips has its peculiar frænulum; the upper one under the nofe, and the under one near the roots of the dentes incifores: they are of the utmoft fervice to us in fpeaking, eating, and drinking.

The lips may be wounded either with fharp or blunt inftruments, or with bullets. Wounds of the firft fort, whether made lengthwife or tranfverfe, are generally to be cured by the dry future; the patient, in this cafe, moft carefully avoid both chewing and talking; his diet, therefore, muft be entirely fpoon-meat. If the wound is very large, it will require the bloody, or true future. In wounds made by blunt inftruments, by falls, or by bullets, the fhattered parts fhould be brought to digeftion; and the lips of the wound, after being cleaned, be brought together, either with fticking plafters, or by the future ufed for the hare-lip.

The moft dreadful diforder in the lips, is the cancer, which is, as in the other parts of the body, of two kinds, *viz.* latent, and ulcerated: by a latent cancer, is here meant a hard, painful and inflammatory tumour in the lip; and the ulcerated cancer is when the tumour degenerates into a fpreading fetid ulcer, difcharging an acrimonious offenfive matter, which corrodes not only the lips, but every part of the face it touches. This fpecies is generally feated in the lower lip, which it quickly divides, as if it were flit. See a more particular account of the nature and caufes of this diforder, under the article CANCER.

The cure of a cancer in the lips is to be performed by different methods, according to the particular condition of the diforder: for, 1. When only a fmall chap or fiffure infefts the upper part of the lip, like a painful and inflammatory ulcufcle, the caufe of the diforder being external, from cold, or the like, it may then be proper to treat it with honey of rofes, balfam of Peru, or faturnine unguent with mercury, and afterwards to cover it with a plate of lead that has been rubbed with mercury; and this continued and renewed till the diforder difappears: in the mean time, a proper regimen and courfe of medicines ought not to be neglected. The juice of rotten apples, mixed with mercurius dulcis, has alfo afforded great relief under this diforder. But when neither thefe, nor any other medicines, are of any fervice, and the diforder grows worfe and worfe, the only remedy is to extirpate the cancerous part of the lip, by two or three incifions with a fcalpel or lancet, obferving to remove fome of the found parts, rather than leave the leaft bit of the cancer behind; and then you may conjoin the lips of the wound by two needles, as in the hare-lip; or when, the fiffure is but fmall, by the futura nodofa. 2. When the cancer is not yet ulcerated, but infefts that part of the lip next the fkin, with a very hard and painful tumour, it is the beft way (as the application of cauftics is generally dangerous in thefe cancers) to extirpate it by the fcalpel, or fciffars: the method of amputation for thofe that are moveable, is to make an incifion through the fkin with a fcalpel, and after freeing the tubercle from its adhefions with the knife or fciffars, the wound is then to be healed in the ufual manner; but fuch as are fixed and immoveable, are to be extirpated, together with part of the lip in which they were contained, treating the wound afterwards by future, as in the hare-lip. But in whatever method you proceed, it will be to no purpofe, if the patient does not obferve a proper regimen of diet and medicines, with bleeding and lenient purges,

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Fig. 1. LINNET, Cock, Hen, and Egg.
Fig. 2. The LION, & LIONES.
Fig. 3. HARE-LIP.
Fig. 4 LOCUS GEOMETRICUS.
N.º 1.
N.º 2
N.º 3.
N.º 4.
N.º 5
N.º 6.
N.º 7.
N.º 8.
J. Jefferys. sculp


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purges, to prevent a ſpeedy return of the diſorder.

Hare-Lip, a diſorder in which the upper lip is in a manner ſlit or divided, ſo as to reſemble the upper lip of a hare, whence the name.

Sometimes the diviſion is ſo large, that it appears as if part of the lip was wanting; and ſometimes again the diviſion is double. A like fiſſure is alſo ſometimes made in the lower lip by a wound that has been neglected, or improperly treated: this laſt ſpecies of the diſorder is termed the ſpurious hare-lip; the true kind is born with the infant. The leſs and more equal the fiſſure of the hare-lip is, it is generally ſo much the more eaſily cured. In ſome infants, the diviſion of the lip is ſo large and irregular, that there can be but little hopes of a cure, which may, however, be eaſily performed on the very ſame lip, when adult. Sometimes too we meet with a tooth projecting forward into the fiſſure; in this caſe it cannot be cured without firſt taking out the tooth. In a recent hare-lip, or one made by a wound, the cure is to be performed by the knotted ſuture. See the articles Suture and Wound.

In curing the hare-lip, where part of the lip is wanting, no attempt can be made to ſupply what is deficient, but only to unite thoſe parts which are divided, by taking off the ſkin from the edges of the fiſſure, and then cauſing them to unite and grow together, by paſſing through them two or three needles, made of gold or ſilver, pointed with ſteel, from the right to the left, beginning with the upper part of the fiſſure, and inſerting them at about a ſtraw's breadth from each other: the ſurgeon having thus entered the needles, and cleanſed the bleeding lips with a ſpunge, he takes a piece of ſtrong wax thread or ſilk, and faſtening it about one end of the needle, he winds it over the other end, and back again, as in plate CLIX. fig. 3. and afterwards ſecures it by a knot: by this means the edges of the lips are brought cloſe together, and the upper part or ſurface kept ſmooth and even. To heal the wound internally, it is dreſſed with ſoft lint dipped in honey of roſes, and put between the gums and lip; but this practice can only be followed with adults: the external part of the wound is at the ſame time dreſſed with balſam of Peru, or ſome other vulnerary unguent, covered with lint and compreſs, and over that a ſticking plaſter with four heads, two of which are faſtened on the left ſide of the lip, and two upon the right, and the whole ſecured by a ſling or fillet, whoſe extremities may be faſtened about the head, either by a knot or pins. But it muſt here be obſerved, that when the fiſſure appears large and deep, ſo that the two parts of the lip cannot be eaſily joined, it will be neceſſary, before the above operation, to divide the frænulum of the upper lip from the gum with a pair of ſciſſars, but without wounding the gum, or uncovering the jaw. Though the hæmorrhage is often very plentiful in performing theſe operations on young infants, yet it is not dangerous, ſince it prevents an inflammation, and generally ceaſes after tying the bandages.

The dreſſings ought not to be moved before the third day, unleſs ſome accident makes it neceſſary; and then it muſt be done with great caution, to avoid ſeparating the parts in contact. If the lips of the wound appear conjoined, three or four days after the operation, you may then venture to draw out the middle needle, when there are three, or the upper one, when there are only two; and two or three days after draw out the other; the cure muſt be completed by dreſſing every day, as at firſt.

LIPOTHYMIA, fainting, in medicine, may ariſe from ſeveral cauſes, as too violent exerciſes, ſuppreſſion of the menſes, or other accuſtomed evacuations, &c.

A lipothymy is often ſymptomatic, accompanying the ſcurvy, malignant fevers, and the like diſorders; which being cured, the diſpoſition to faintneſs ceaſes of courſe.

As to the cure of an idiopathic lipothymy, proceeding from the ſight of blood, wounds, ulcers, or any chirurgical operation, nothing more is neceſſary than to change the room, and go into freſh air; and if this cannot be done, the ſmell of hungary water, volatile ſpirits, wine, and ſtrong vinegar, ſprinkling the face with cold water, or a draught of generous wine, will recover the drooping ſpirits of the patient. When a perſon to be let blood is afraid of fainting, he ſhould be laid upon a bed.

In more grievous fainting fits, where gentle cordials are of little uſe, the ſtronger ſort muſt be applied, as ſpirit of ſal ammoniac, to the noſtrils, temples, and pulſes, with ſtrong frictions; or forty or fifty

fifty drops of volatile ſpirits may be given internally, to which may be added cinnamon-water, orange-flower-water, or the like; nor forgetting a draught of generous wine, with vellications and frictions of the extremities, noſe, ears, head, hair, &c. till the perſon recovers. When the patient is hyſteric, none but fetid things ſhould be applied to the noſe; ſuch are caſtor, aſa fœtida, burnt feathers, leather, horn, and the like.

If the lipothymy proceeds from exceſſive hæmorrhages, they muſt be ſtopped as ſoon as poſſible; and the patient muſt take broths, jellies, ſpirituous liquors, and generous wine, till quite recovered; which remedies are alſo to be uſed, when it proceeds from diſeaſes, loſs of ſtrength, or a defect of ſpirits and good juices.

LIPPIA, in botany, a genus of the didynamia angioſpermia claſs of plants, the flower of which is monopetalous and ringent, with a quadrifid limb; the fruit is a bivalve unilocular capſule, containing two ſeeds, which grow together.

LIQUIDAMBER, in botany, a genus of the monoecia-polyandria claſs of plants, having no corolla; the ſtamina are very numerous ſhort filaments; the calyces of the female flower are collected into a kind of globe, each conſiſting of four leaves; there is no corolla; the ſtyles are two; the fruit is compoſed of a number of oblong, bivalve unilocular capſules, formed into a globular body; the ſeeds are numerous and oblong.

This tree, which grows to a vaſt ſize, is a native of America, where a very fragrant reſin is obtained from it in great abundance, called liquidamber, which heats and moiſtens, reſolves and opens obſtructions, and is an emollient and ripener. Its principal uſe is in obſtructions and hardneſſes of the womb, in hard tumours, &c.

LIQUOR, See Drink, Fluid, &c.

Medicated liquors are directed by Boerhaave, to be made thus: take a dram of any elæoſaccharum, and two drams of the medicated ſalt of Tachenius; grind them together in a glaſs-mortar, till they become thoroughly mixed: then add ſix ounces of the cohobated diſtilled water of the ſame plant from whence the elæoſaccharum was made; and thus, in a ſmall compaſs, the virtue of a plant may be collected together for medicinal uſe, and according to its own nature in the body. The doſe of theſe medicated liquors is principally determined from the power of the oil employed in them; the time for giving them, is chiefly when the ſtomach is empty, and according to the nature of the diſtemper; for example, a tertian fever, very cold in the beginning, is to be cured after this manner.

Liquor mineralis anodynus, is a name given by Hoffman to a liquor of his invention, famous at this time in Germany, and ſuppoſed by Burggrave to be made in this manner: take oil of vitriol, and indian nitre, of each four ounces: diſtil the ſpirit gradually from this, by a retort: pour two ounces of the ſpirit cautiouſly and ſucceſſively, into fifteen ounces of ſpirit of wine, highly rectified; diſtil this, and there comes over a very fragrant ſpirit: this is to be again diſtilled, to render it perfectly pure, adding firſt to it a ſmall quantity of oil of cloves, and a quantity of water, equal to that of the ſpirit; after this, as ſoon as the watery vapours begin to riſe, the whole proceſs is to be ſtopped, and the ſpirit kept alone in a bottle, well corked. This has great virtues as an anodyne, diaphoretic, antiſeptic, and carminative. It is not certain that this is the ſame with Hoffman's, that author never having publiſhed his manner of making it; but it appears the ſame to the ſmell and taſte, and has the ſame virtues.

LIQUORICE, in the materia medica, the root of a plant called by botaniſts glycyrrhiza. See Glycyrrhiza.

It is an excellent medicine in coughs, and all diſorders of the breaſt and lungs: it obtunds the ſharpneſs of acrid and ſalt humours; and is alſo recommended againſt diſorders of the kidneys and bladder. It is an ingredient in almoſt all decoctions and ptiſans, in which it is eſteemed for obtunding the acrimony, and drowning the worſe flavour of the other ingredients: and it is alſo uſed in moſt ſyrups and electuaries. The only ſimple preparations of it in uſe, is its inſpiſſated juice, commonly known by the name of ſpaniſh juice of liquorice, as being brought originally from Spain; this hath the ſame virtues as the root itſelf. It is to be choſen firm, but not tough, hard, and, when broken, of a fine ſhining ſurface; ſuch as melts in the mouth without leaving any harſh or gritty particles in the teeth, and does not taſte of burning. It is made in the ſame manner as the other extracts. See the article Extract.

LIRIODENDRUM, the tulip-tree, in botany, a genus of the polyandria-polygynia

nia clafs of plants, the flower of which confifts of fix or nine petals, which are oblong, erect, obtufe, narroweft at the bafe, and equal: there is no pericarpium, the feeds being clofely arranged together in an imbricated manner; they are numerous, and terminate in a fquama of a lanceolated form.

LIS, a river which rifes at Lifburg in Artois, and paffing through part of the Netherlands, unites its waters with the Scheld at Ghent.

LISBON, the capital of Portugal, fituated on the north bank of the Tagus, about ten miles from its mouth, and eighty miles weft of the frontiers of Spain: weft long. 9°, 25′, north lat. 38° 25′. It is about fix miles long, winding with the river, from whence it rifes with an eafy afcent, and is computed to contain about 30,000 houfes, 200,000 inhabitants, forty parifh churches, and forty convents of both fexes.

LISIEUX, a large city and bifhop's fee of France, in the province of Normandy: eaft longitude 16′, and north latitude 40° 14′.

LISLE, or RYSSEL, a large and populous city, the capital of French Flanders, fituated on the river Deule, twelve miles weft of Tournay: eaft long. 3°, and north lat. 50° 42′.

LIST, in commerce, the bordure of cloth, or of a ftuff; ferving not only to fhew their quality, but to preferve them from being torn in the operations of fulling, dying, *&c.*

Lift is ufed on various occafions; but chiefly by gardeners, for fecuring their wall-trees.

LIST, in architecture, a little fquare moulding, otherwife called a fillet, liftel, *&c.* See FILLET and MOULDING.

LITANY, a folemn form of fupplication to God, in which the prieft utters fome things fit to be prayed for, and the people join in their interceffion, faying, *we befeech thee to hear us, good Lord, &c.*

At firft, the ufe of litanies was not fixed to any ftated time, but were only employed as exigencies required. They were obferved, in imitation of the Ninevites, with ardent fupplications and faftings, to avert the threatning judgments of fire, earthquakes, inundations, or hoftile invafions. About the year 400, litanies began to be ufed in proceffions, the people walking barefoot, and repeating them with great devotion; and it is pretended, that by this means, feveral countries were delivered from great calamities. The days on which thefe were ufed, were called rogation days: thefe were appointed by the canons of different councils, till it was decreed by the council of Toledo, that they fhould be ufed every month throughout the year; and thus by degrees they came to be ufed weekly on Wednefdays and Fridays, the antient ftationary days for fafting. To thefe days the rubric of our church has added Sundays, as being the greateft days for affembling at divine fervice. Before the laft review of the Common Prayer, the litany was a diftinct fervice by itfelf, and ufed fometime after the morning prayer was over; at prefent it is made one office with the morning fervice, being ordered to be read after the third collect for grace, inftead of the interceffional prayers in the daily fervice.

LITCHFIELD, a city of Staffordfhire, one hundred miles north-weft of London, and twelve fouth-eaft of Stafford. This city and Coventry have one bifhop between them: it fends two members to parliament.

LITERATI, in general, denotes men of learning; but is more particularly ufed by the Chinefe, for fuch perfons as are able to read and write their language. See the article CHINESE.

LITHANTHRAX, PIT-COAL, in natural-hiftory, a genus of foffils, defined to be folid, dry, opake, inflammable fubftances, found in large ftrata, fplitting horizontally more eafily than in any other direction, of a gloffy hue, foft and friable, not fufible, but eafily inflammable, and leaving a large refiduum of afhes.

Of this genus there are three fpecies, 1. The hard, dufky, black coal, known in London by the name of fcotch coal. 2. The hard, gloffy, black coal, known by the fame name; though both thefe fpecies are found alfo in England, particularly about Limington and in Wales. 3. The friable, gloffy, black coal, called Newcaftle coal, as being chiefly dug about that town.

LITHARGE, is properly a recrement of lead, or lead vitrified, either alone, or with a mixture of copper. It is of two kinds, differing in colour, though in no other quality; the one of thefe is called litharge of gold, and the other litharge of filver: thefe are collected from the furnaces where filver is feparated from lead, or from thofe where gold and filver are purified by means of that metal; but

the litharge fold in the fhops is produced in the copper-works, in which lead is ufed either to purify the metal, or to feparate the filver from it: this is of a redder or yellower colour, as the fire has been more or lefs ftrong, and is always compofed of a multitude of thin flakes. Litharge is foluble in oil, and all other unctuous fubftances; and thus diffolved, it makes the bafis of a great part of the ointments and plafters of the fhops. It is drying, abftergent, and flightly aftrictive, and hence it is of great ufe in cleanfing ulcers, and difpofing them to incarnate.

LITHIDIA, in natural hiftory, the name of a large clafs of foffils, including the flint and pebble kinds. See the articles FLINT and PEBBLE.

The lithidia are defined to be ftones of a debafed cryftalline matter, covered by, and furrounded with, an opake cruft, and frequently of great beauty, and confiderable brightnefs within, tho' of but a flight degree of tranfparency, approaching to the nature of the femi-pellucid gems, and like them found in not very large maffes. See the article GEM.

The bodies of this clafs are divided into two general orders, and under thofe into three genera. The firft order of the lithidia contains thofe compofed of a cryftalline matter, but flightly debafed, and that ever by one and the fame earth, tho' diffufed thro' them in different degrees, and always free from veins. The fecond order is of thofe of a more debafed cryftalline matter, blended with different portions of different coloured earths. Of the firft of thefe orders there is only one genus, which is that of the common flint. Of the fecond order there are two genera. 1. The homochroa, which are of one plain and fimple colour; and, 2. The calculi, which are compofed of crufts of feveral different colours. Both thefe genera are comprifed under the common Englifh name of pebbles.

LITHOCOLLA, a cæment ufed by lapidaries for faftening precious ftones together. See the article CÆMENT.

LITHOGENESIA, a term ufed by fome authors, for the formation of ftones. See the article STONE.

Henkel has thrown together fome very ingenious thoughts on this abftrufe fubject, in a treatife publifhed in the year 1734, where he builds no opinion on any other bafis than that of facts, obfervations of nature, and experiments. He fuppofes that the earth was at firft every where foft on the furface, and that this foft matter, by degrees, hardened, and formed ftones of feveral kinds. He feems to imagine, that the furface of the earth was a fecond time all reduced to this foft ftate by the univerfal deluge at the time of Noah, and that this matter, afterwards hardening into ftones of various kinds, included the fhells of fea-fifhes, and other animal-remains of the produce of the feas, in flints, in lime-ftone, or in whatever other fubftance the matter among which they lay chanced to harden. Thus may the fea-fhells, found fingly in the middle of hard flints, or lodged in vaft numbers in the ftrata of earth, limeftone, or marble, be accounted for. Waters of other kinds we are very fenfible may carry particles of ftony matter, and lodge them fo in other bodies, as to form complete, hard and folid ftones: this is frequently done at this day in the common petrifactions of wood, and in the ftones generated in the bladders of animals. If this be allowed a property common to feveral fluids, and to water in feveral ftates, there is no reafon why it fhould be denied to have exifted in that of the univerfal deluge; and if that be acknowledged to have had a power of forming ftones of various kinds, there is no wonder that ftones of various kinds fhould be found in the ftrata, and on the furface of this earth, which was all covered by that water; or that the ftones formed in that immenfe body of water fhould fhew, as they do in many inftances, the feveral crufts or coats laid one upon another, by the fucceffive applications of the matter of which they were formed. If we confider alfo the immenfe quantity of animal and vegetable-bodies; fome entire, others only feparated into parts, which muft have been mixed with, floating among, or lying upon the bottom of this immenfe bed of water; and that ftones were continually forming out of this water at this time; we cannot wonder that thefe ftones fhould take up thefe parts of plants or animals, or concrete about them, or that we fhould find fhells and teeth of fifhes, or pieces of wood, or leaves of plants preferved in them. Nor is water alone the agent that may have made thefe changes in the once foft parts of the earth's furface; we can by fire reduce the pooreft earths into a fort of glafs, a hard tranfparent body, not a little refembling the nature of flint or the other femi-

ſemi-pellucid ſtones. Fire has a power to do great things in the bowels of the earth, and the way to learn what changes it may there make in ſtones, is to try its effects upon the ſeveral different kinds of ſtones and earths here. By experiments of this kind we learn, that of the ſeveral ſpecies of ſtones in their preſent ſtate, ſome are reduced to a friable maſs, and finally to powder, by the force of fire, others are hardened by it, others are melted, and become a kind of glaſs: and by experiments, on the other foſſile-ſubſtances, it appears, that the original matter of all ſtones has been earth, either of the nature of chalk, marle, or clay; and that many of them have been greatly altered by receiving metallic or other mineral matter into their earthy matter, at the time of their formation; and all ſeem to have owed their change into their hard ſtate, either to fire alone, or to ſaline oily, metallic, or ſaline ſulphureous matters, either conjunctly with the force of this agent, or alone.

Thoſe ſtones, which were formed in their preſent ſtate, immediately out of fluids, have been produced either by congelation, a rude coalition, or cryſtalization; and that all the gems have been once fluid, is plain from their imperfections in certain inſtances, as from their containing grains of ſand, or the like extraneous ſubſtances, firmly embodied in them. If theſe, the hardeſt of all ſtones, have been once fluid, there is no reaſon to diſpute, but that all the other kinds may have been ſo, which are leſs hard and leſs perfect.

LITHOMANTIA, Λιθομαντεια, in antiquity, a ſpecies of divination performed with ſtones. Sometimes the ſtone, called ſiderites, was uſed: this they waſhed in ſpring-water, in the night, by candle-light; the perſon that conſulted it was to be purified from all manner of pollution, and to have his face covered: this done, he repeated divers prayers, and placed certain characters in an appointed order; and then the ſtone moved of itſelf, and in a ſoft, gentle, murmur, (or as ſome ſay) in a voice like that of a child, returned an anſwer. By a ſtone of this nature, Helena is reported to have foretold the deſtruction of Troy.

LITHOMARGA, *Stone marle*, a name given by ſome authors to a ſparry ſubſtance highly debaſed by earth, which is found in great plenty in the caves of the Hart's foreſt in Germany, and uſed there in medicine, under the name of the unicornu foſſile, or foſſile unicorn's horn, from its ſometimes emulating that figure. See the articles MARLE and UNICORNU.

LITHONTRIPTICS, medicines which either break or are ſuppoſed to have the virtue of breaking ſtones in the urinary paſſages. Of this kind is Mrs. Stephen's medicine, which is a compoſition of ſoap and lime made of different ſhells, which every body knows to be highly cauſtic, and is therefore condemned by Dr. Mead; ſince its corroſive quality muſt be injurious to the bladder: however, under proper management, he thinks it may be of ſome ſervice in expelling gravel by the urinary paſſages; tho' it will never be able to break calculi of the hardneſs of ſtone. Dr. Whytt, of Edinburgh, after conſidering the inconveniencies and ſometimes miſchiefs of this celebrated ſpecific, reſolved to omit the ſoap, and try what virtues lime-water would have without it, in diſſolving the calculus; and found that lime-water made by pouring ſeven or eight pints of water on one pound of freſh calcined oyſter or cockle-ſhells, poſſeſſed a greater power of diſſolving the calculus, than that of ſtone-lime; and by giving four pints of it a day to adults, and to children in proportion, he found that it produced the moſt happy effects.

LITHOPHYTA, in botany, a ſubdiviſion of the cryptogamia claſs of plants, ſo called from their approaching to a ſtony hardneſs, comprehending the iſis, ſpongia, millepora, tubipora, *&c.*

LITHOSPERMUM, GROMWELL, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla of which conſiſts of a ſingle petal of the length of the cup: the tube is cylindric, the limb ſemiquinquifid, obtuſe and erect: there is no pericarpium, but the cup becomes patulous and long, containing four broad, oval, acuminated and hard ſeeds.

The ſeeds of this plant, being the only parts uſed in medicine, are accounted diuretic. Emulſions are made of them with dog's graſs-water.

LITHOSTROTION, in natural hiſtory, the name of a ſpecies of foſſile-coral, compoſed of a great number of long and ſlender columns, ſometimes round, ſometimes angular, jointed nicely to one another, and of a ſtarry or radiated ſurface at their tops. Theſe are found in conſiderable quantities in the northern and

weſtern

weftern parts of this kingdom, fometimes in fingle, fometimes in complex fpecimens. See the article CORAL.

LITHOTOMY, in furgery, cutting for the ftone. See the article STONE.

Mr. Sharp lays down the following method of fearching for the ftone. The patient being laid on an horizontal table with his thighs elevated, and a little extended, pafs the found, or catheter, with the concave part towards you, till it meets with fome refiftance in the perinæum a little above the anus; then turning it without much force, pufh it gently on into the bladder, and if it meets with an obftruction at the neck, raife its extremity upwards, by inclining the handle of it towards you; and if it does not then flip in, withdraw it a quarter of an inch, and introducing your fore-finger into the rectum, lift it up, and it will feldom fail to enter. Though, upon fearching, the furgeon may be affured of a ftone in the bladder, yet he is not without farther inquiry to operate immediately; fince there are fome obftacles that forbid the operation, either abfolutely, or only for a certain time. Among thefe, that of the greateft confequence is the gravel or ftone in the kidneys, which is known by the pain in the loins, vomiting, retraction of the tefticles, numbnefs of the thighs, and often by matter which the inflammation produces in the kidneys. Difference of age make an extreme difference in danger, infants and young people almoft always recovering; but ftill the operation is advifeable in thofe advanced in years, though it is not attended with near the fame fuccefs. Before the operation is performed, it is proper to prepare the patient with a gentle purge the preceding day, and a clyfter early in the morning, which will be of great fervice in cooling the body and making the operation lefs dangerous, where the rectum is liable to be wounded when full.

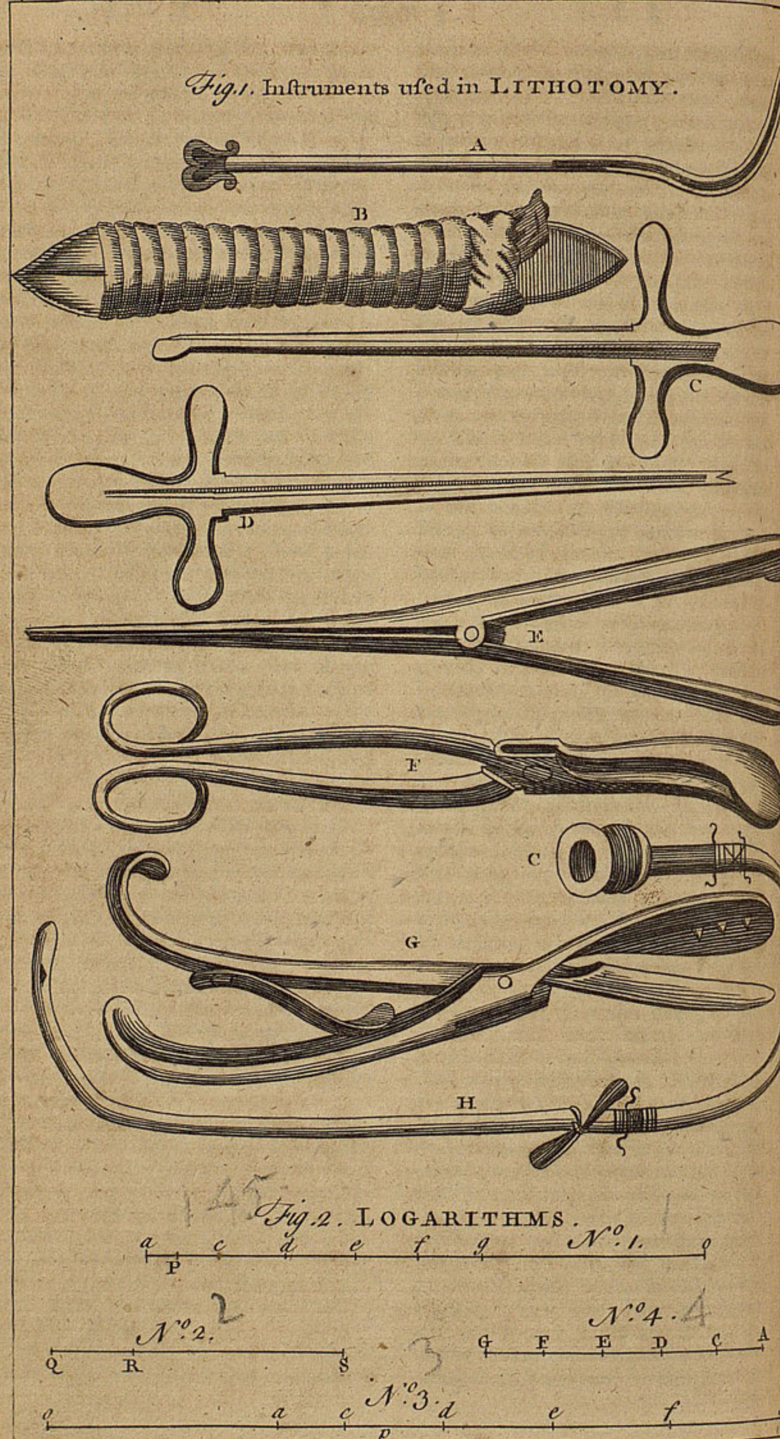
The moft convenient time for the operation of lithotomy is fpring or autumn, though when the patient is in exquifite torment, or his life in danger, the prefent opportunity fhould be embraced. Lithotomy is of two kinds: that made into the bladder is termed cyftotomy; but when the ftone is in the kidneys, which very rarely happens, the operation is termed nephrotomy.

With refpect to the feveral methods of performing lithotomy for the ftone in the bladder, they, according to Heifter, are four: the firft, and moft antient, is the apparatus minor, called likewife the celfian or guidonian method: the fecond the apparatus magnus, or Marianus's method; the latter being termed the new, and the former the old method: the third is the apparatus altus, or hypograftic fection; wherein the incifion is made at the lower part of the abdomen in the anterior fide of the bladder, immediately above the os pubis; whereas in the reft it is made in the perinæum, between the anus and the fcrotum: the fourth, and moft modern method, was invented toward the end of the laft century, and is termed the lateral operation.

1. The firft method is now entirely laid afide, though Heifter thinks it practicable on boys under fourteen: the wound of the bladder in this operation, fays Sharp, is made in the fame place as is now practifed in the lateral method; but its being impracticable on fome fubjects, and uncertain in all others, has made it to be univerfally exploded.

2. In performing lithotomy by the apparatus major, Mr. Sharp's directions for the fituation of the patient are thus. Having laid the patient on a fquare horizontal table, three feet four inches high, with a pillow under his head, let his legs and thighs be bent, and his heels made to approach his buttocks by tying his hands to the foles of his feet with a couple of ftrong ligatures; and to fecure him more effectually from ftruggling, pafs a double ligature under one of his hams, and carry the four ftrings round his neck to the other ham: then paffing the loop underneath, make a knot by threading one of the fingle ends through the loop; and thus the thighs are to be widened from each other, and firmly fupported by proper perfons.

The patient thus fituated, Heifter directs the operation as follows: the operator, dipping the beak of a fizeable and grooved fteel catheter A (plate CLX. fig. 1.) in oil, he conveys it thro' the urethra into the bladder, and being affured there is a ftone, turns the crooked part of the catheter in the bladder and urethra towards the left fide of the perinæum, but the handle and penis which contains it, towards the right inguen, then delivers it to the affiftant, who holds up the fcrotum in the other hand; for the crooked convex part of the catheter thus elevated in the perinæum, renders


Fig. 1. Instruments used in LITHOTOMY.
A
B
C
D
E
F
C
G
H
Fig. 2. LOGARITHMS.
a c d e f g N°. 1. o
P
N°. 2.
Q R S
N°. 4.
G F E D C A
N°. 3.
o a c d e f
p
J. Jefferys

renders that part of the urethra which is to be divided, fufficiently perceptible both to the fight and touch. He next lays hold of the integuments of the perinæum with the fingers of his left hand, holding in his right the incifion-knife, B, wrapped in linen, as he would do a pen for writing: with this he makes a longitudinal incifion downwards, about the middle of the left fide of the perinæum near the future, through the fat; then he again feels for the catheter, and afterwards divides the urethra in a direct line downward, fo that the end of the knife may pafs into the groove of the catheter. After a proper incifion, the furgeon parts with his knife, inferting in the groove of the catheter, if an affiftant holds it, the nail of his finger or thumb: then he takes a male conductor, C, dips it in warm oil, and having paffed it thro' the groove of the catheter and neck of the bladder into the bladder itfelf, extracts the catheter. The male conductor being thus paffed, a female conductor, D, is introduced upon it, in fuch a manner as the latter receives the prominent back of the former in its groove, and conveys it fafely into the bladder thro' its neck. After this the two conductors are gently feparated by their handles, and then a ftraight forcep, E, dipt in oil and fhut very clofe, is carefully conveyed into the bladder between the conductors. The forceps, after it is introduced, and the conductors withdrawn, muft be opened feveral times to dilate the wound, and then fhut to fearch for the ftone: when the ftone is found, they muft be opened with both hands, in fuch a manner that one jaw, if poffible, may lay hold under the ftone, and the other above it. When the ftone is thus intercepted, the forceps, by a gentle motion from fide to fide, muft be brought towards the rectum, and the ftone extracted downwards, becaufe the parts dilate and yield more eafily that way, while upwards they meet with a refiftance from the os pubis: but if it lies concealed in any part of the bladder, and cannot be laid hold of by the forceps, the operator muft pafs the two firft fingers of his hand in the anus, elevate the ftone, and force it into them. If it is fituated in the upper part of the bladder, behind the offa pubis, the inferior part of the abdomen muft be preffed downwards by the hand, that it may commodioufly be taken hold of, and drawn out by the ftraight or a crooked forceps; and if it is lodged on either fide, the crooked inftrument F is moft convenient.

When the ftone is too large to be extracted whole, it muft be broken by a forceps, G, with teeth, and the fragments to be drawn out one after another. Laftly, if the ftone is too large and too hard to be either extracted or broken, a prudent furgeon will defift, and heal the wound or leave a fiftula for the difcharge of the urine. The ftone being thus extracted, and the bladder cleared, the wound is cleanfed with a fponge, the ligatures untied, the patient put to bed, and the wound now dreffed with doffils of fcraped lint: if the hæmorrhage be too profufe, it may be ftopped by pledgets of lint dipt in a proper ftyptic, and the arteries compreffed with the fingers till it ftops. Thefe muft be covered with a linen bolfter, and a large fquare comprefs without a plafter, fecuring the whole with the T bandage, or that with four heads; and if they are ineffectual, the artery muft be tied up with a crooked needle and thread. See HÆMORRHAGE.

After dreffing, the patient muft be fupplied with plenty of ptifan, barley-water, or a ftrengthening and compofing emulfion; his diet fhould be the fame as for people in fevers, or after great wounds. See the articles FEVER and WOUND.

3. The apparatus altus, or high operation, is performed as follows. The patient being duly prepared, and laid in a proper fituation, a hollow filver-catheter, with a flexible leathern tube H *(ibid.)* at the end of it is to be introduced into the bladder: to the tube muft be fitted a large fyringe, for the injecting of fuch warm water, barley-water, or milk, as the patient can bear. When this is done, the catheter is extracted: then while an affiftant introduces his two fore-fingers into the anus to elevate the ftone and bladder, the operator makes an incifion in a right line through the fkin, fat, and abdominal mufcles, immediately above the offa pubis. The external wound fhould be three fingers-breadth long in children, and four in adults; then introducing the left index, the furgeon feels for the liquor that diftends the bladder, and then makes an incifion into the bladder immediately above the juncture of the offa pubis: after which he paffes a fmall knife into the body of the bladder, fo as to make a fmall wound with the point only; through this aperture he paffes a crooked or ftraight knife, armed with

with a button, whereby he enlarges the wound upwards the breadth of one or two fingers. He then introduces his left index to draw the upper part of the bladder towards the navel, and then enlarges the wound downwards. Immediately after, he introduces the fore-finger of the other hand, and examines the ſize and ſituation of the ſtone, and accordingly he enlarges the wound either upwards or downwards, in order to extract it. And when the ſtone is extracted, and nothing left, the wound is dreſſed, and the patient treated much in the ſame manner as in the former caſe.

4. The fourth method, which is called the lateral operation, is performed by Cheſelden thus: every thing being properly prepared, he introduces a catheter, and afterwards makes an inciſion of a proper length, beginning where they end in the apparatus major, and continuing it downwards between the accelerator urinæ, and erector penis, on the left ſide of inteſtinum rectum; and directing his knife to the poſterior part of the catheter, through the inferior and lateral part of the bladder, behind the proſtate gland, and above the ſeminal veſicles, he then continues it forwards through the ſphincter of the bladder, and left ſide of the proſtrate glands into the membranous part of the urethra even to its bulb, which preſerves the rectum better than the lateral method.

Among Cheſelden's emendations, Douglas enumerates theſe. 1. If he finds the patient's pulſe low after the operation, he applies bliſters to the arms, which effectually raiſe his ſpirits. 2. If the wound grows callous, he lays on a piece of bliſter-plaſter to erode it, by which new fleſh pullulates, and the wound unites. 3. If the wound be putrid, he mixes a little verdigreaſe with ſome digeſtive ointment.

Women are leſs ſubject to the ſtone in the bladder than men, and their urinary paſſages are more ſhort and lax, ſo that in general the ſtone being but ſmall, diſcharges itſelf with the urine, and when it happens to increaſe in the bladder, we have inſtances of its coming away ſpontaneouſly. Douglas propoſes to extract a ſmall ſtone in a woman, by dilating the urethra with a tent of gentian-root, or prepared ſponge; but when the ſtone is large, he approves of the high operation, diſtending the bladder with warm water, and compreſſing the urethra by an aſſiſtant's finger in the vagina, and then making an inciſion into the bladder immediately above the os pubis. This, Heiſter ſays, is a very proper method, when the ſtone is very large, and the patient young and healthy; but Morand, when the ſtone is ſmall, prefers the apparatus major.

Upon the whole, lithotomy appears to be a dangerous and precarious operation, nor can one method alone be depended on; but the ſurgeon muſt be determined in the choice, by the particular circumſtances of the caſe.

Nephrotomy, the ſecond ſpecies of lithotomy, is by moſt writers on the ſubject thought impracticable, who therefore abſolutely reject it; tho' we have many inſtances of perſons, who have been cured of wounds of the back penetrating to the kidneys. Heiſter mentions one cure of this kind performed by himſelf. Wounds, therefore, of the kidneys, eſpecially thoſe inflicted on the back, without penetrating into the cavity of the abdomen, he ſays, are often curable. And though Hippocrates prohibits his pupils from practiſing lithotomy, yet in treating of diſorders in the kidneys, in his work De Intern. Affect. he directs to make an inciſion near the kidneys when it is tumefied and elevated, and after extracting the pus, to diſcharge the gravel by diuretics; for this opening may preſerve the patient, who muſt otherwiſe die: and again, he ſays, when the kidney, being ſuppurated, tumifies near the ſpine, a deep inciſion ſhould be made upon the tumour near the kidney, or into the kidney itſelf. Hence it is manifeſt, that a wound in theſe parts did not appear ſo formidable to him. Rouſet, Riolanus, and others, think nephrotomy may be practiſed with ſucceſs, if the opening is made where the ſtone is perceptible, and neither the emulgent artery, vein, nor ureter wounded, nor the cavity of the abdomen penetrated. But beyond all diſpute it muſt be reaſonable, when nature points out the place by a tumour or abſceſs in the loins, proceeding from a ſtone in the kidneys.

LITHOXYLUM, in botany, a term uſed by Linnæus, to expreſs a heterogeneous ſubſtance on ſea-plants, which has fructifications in impreſſed points.

LITHOZUGIA, in natural hiſtory, a genus of foſſils, of the claſs of the ſcrupi, compoſed of a ſimply ſtony matter, making

ing a kind of cement, and holding firmly together ſmall pebbles, *&c.* embodied in it. See the article SCRUPI.

There are two kinds of the lithozugia. 1. That of a cryſtalline baſis and purer texture, approaching to the nature of flint, called by the engliſh lapidaries the pudding-ſtone: of this kind are reckoned four ſpecies; the yellowiſh white lithozugium, the greyiſh white lithozugium, the red lithozugium, and the browniſh lithozugium, all filled with pebbles. 2. The lithozugia of a coarſer texture, approaching to the nature of quarry-ſtone: of this kind there are alſo reckoned four ſpecies, *viz.* the freſh-coloured lithozugium, filled with reddiſh, impure, cryſtalline nodules; the bluiſh, glittering lithozugium, filled with white, impure, cryſtalline nodules; the whitiſh, green, elegant lithozugium, filled with cryſtalline nodules; and the friable, pale, red lithozugium, variegated with white veins and red nodules.

LITHUANIA, a province of Poland, bounded by Samogitia, Livonia, and part of Ruſſia, on the north; by another part of Ruſſia, on the eaſt; by Volhinia and Poleſia, on the ſouth; and by Pruſſia and Polachia on the weſt.

LITURGY, λειτυργια, a name given to thoſe ſet forms of prayer which have been generally uſed in the chriſtian church. Of theſe there are not a few aſcribed to the apoſtles and fathers, but they are almoſt univerſally allowed to be ſpurious.

The modern liturgies are diverſified according to the diverſity of nations profeſſing the chriſtian religion. Of theſe there are the armenian liturgy, compoſed by one of their patriarchs, named John; that of the cophti or chriſtians of Egypt, written in the cophtic or egyptian language: the æthiopian liturgy, written in the old æthiopic tongue, ſaid to be written by Dioſcorus, patriarch of Alexandria; the Greeks have four liturgies, *viz.* thoſe of St. James, St. Mark, St. John Chryſoſtom, and St. Baſil; but they ordinarily read only the latter, the liturgy of St. James being read only at Jeruſalem, and that of St. Mark only at Alexandria: the ſyriac liturgies are much more numerous than the Greek; for father Simon tells us, that the jacobites reckon up forty different liturgies, all under different names. The miſſal of the Maronites contains twelve liturgies, under the names of St. Xyſtus, pope; St. John Chryſoſtom; St. John the evangeliſt; St. Peter, the apoſtle; St. Dionyſius; St. Cyril; Matthew, the paſtor; John, patriarch; St. Euſtathius; St. Maruta; St. James, the apoſtle; St. Mark, the evangeliſt; and a ſecond of St. Peter: and the Neſtorians have three liturgies, that of the twelve apoſtles, that of Theodoſius, ſurnamed the interpreter, and a third under the name of St. Neſtorius.

The liturgy of the church of England was compoſed in the year 1547, ſince which time it has undergone ſeveral alterations, the laſt of which was in the year 1661, and of this liturgy Dr. Comber gives the following character. "No "church was ever bleſſed with ſo com-"prehenſive, ſo exact, and ſo inoffenſive "a liturgy as ours: which is ſo judi-"ciouſly contrived, that the whole may "exerciſe at once their knowledge and "devotion; and yet ſo plain, that the "moſt ignorant may pray with under-"ſtanding; ſo full, that nothing is omit-"ed, which ought to be aſked in public; "and ſo particular, that it compriſeth "moſt things which we would aſk in "private; and yet ſo ſhort, as not to "tire any that have true devotion. Its "doctrine is pure and primitive; its "ceremonies ſo few and innocent, that "moſt of the chriſtian world agree in "them: its method is exact and natu-"ral, its language ſignificant and per-"ſpicuous, moſt of the words and phra-"ſes being taken out of the holy ſcrip-"ture, and the reſt are the expreſſions "of the firſt and pureſt ages." — And in the opinion of the moſt impartial and excellent Grotius, (who was no member of, nor had any obligation to, this church) "the engliſh liturgy comes ſo "near the primitive pattern, that none "of the reformed churches can compare "with it." Again, he ſays, "In the "prayers, a ſcholar can diſcern cloſe "logic, pleaſing rhetoric, pure divinity, "and the very marrow of the antient "doctrine and diſcipline; and yet all "made ſo familiar, that the unlearned "may ſafely ſay, Amen."

LITUUS, in roman antiquity, a ſhort ſtraight rod, only bending a little at one end, uſed by the augurs. See AUGUR.

The appellation lituus is alſo given to a muſical inſtrument of the wind kind, uſed in the roman armies; probably from its reſemblance to the ſacred rod of the augurs.

LIVADIA, the capital of a province of european

european Turky, the antient Achaia, ſituated on the north ſide of the gulph of Lepanto: eaſt long. 23° 15′, north lat. 37° 30′.

LIVER, *hepar*, in anatomy, a very large viſcus, of a red colour, ſituated in the right hypochondrium, and ſerving for the ſecretion of the bile or gall. See the article BILE.

Its figure is irregular; the upper ſurface being convex, ſmooth, and equal; the lower, hollow, and unequal. There is alſo a remarkable eminence called the porta, juſt where the vena portæ enters it.

In the liver we are alſo to obſerve the capſule of Gliſſonius, its diſcoverer; which includes the branches of the vena portæ, and the biliary ducts, as they approach the liver, as well as within it.

The veſſels of the liver are very numerous; receiving arteries from the cœliac, cyſtics, diaphragmatics, &c. veins, from the vena portæ, vena cava, and diaphragmatic vein; and nerves from the plexus hepaticus of the intercoſtals. See the articles ARTERY, VEIN, and NERVE.

The biliary veſſels are the ductus choledocus communis, which opens obliquely into the duodenum; the ductus cyſticus, which runs from the gall-bladder to the common duct; and the ductus hepaticus, which runs from the liver to the common duct; and the branches of this diſtributed through the liver, make what are called pori biliarii. See the articles DUCT, GALL-BLADDER, &c.

The lymphatic veſſels of the liver are to be demonſtrated either by a ligature of the vena portæ in living animals, or by inflation into the artery, or hepatic duct, in dead ones. To theſe veſſels we may add the canalis venoſus, and the great ſinus of the vena portæ in the fœtus. See the article FOETUS.

The ſubſtance of the liver was, by the antients, ſuppoſed to be formed merely of blood, concreted into a firm maſs: Malpighi, and many of the later writers, have determined it to be glandulous; and Ruyſch makes it vaſculous, declaring it to be formed of a congeries of very minute veſſels.

Having already given the external figure of the liver in grown perſons, under the article INTESTINES, we ſhall here give that of a new-born fœtus, whereby the difference between them will be the more readily apprehended. A A A A (plate CLXI. fig. 1.) repreſents the circumference of the liver; B B B B, the lower part of the liver, in which there are ſeveral irregularities; C, the gall-bladder; D, the umbilical vein, running with a ſingle trunk from the navel to the liver; E E E, the ſinuſes of the vena portæ, into which alone the umbilical vein inſerts itſelf, with a ſingle trunk; F, the trunk of the vena portæ cut off; G G G G, the principal branches of the ſinus of the vena portæ diſtributed through the liver, which become conſpicuous when a ſmall part of the ſuperficies of the liver is abraded off; H, the trunk of the vena cava; I, I, the canalis venoſus, or ductus venoſus, ariſing from the ſinus of the vena portæ, over-againſt the ingreſs of the umbilical vein, and inſerting itſelf into the vena cava: this, in the uterus, carries a great part, and probably the greater part of the blood, carried through the umbilical vein to the liver of the fœtus, by a large paſſage to the vena cava and the heart; but this, after the birth of the fœtus, gradually grows narrower and cloſes; K, the entrance of the umbilical vein into the ſinus of the vena portæ.

To this deſcription of the external part of the liver, it may not be improper to add that of its blood-veſſels, together with their numerous ramifications, freed from the parenchymatous ſubſtance. Fig. 2. *ibid.* repreſents the under ſide of theſe veſſels; A being that part of the liver which lies next to the back; B, its right ſide; C, its anterior edge. D, its left ſide; E, the vena cava, where it paſſes through the diaphragm; E 1, E 2, E 3, its three principal branches diſtributed almoſt through the whole liver; F, the vena portæ turned upwards, that other veſſels may be more eaſily ſeen; F 1, F 2, F 3, F 4, four branches of the vena portæ diſtributed to ſeveral quarters of the flat part of the liver, but the fifth branch is not obſerved on this ſide; G, the gall-bladder; H, H, the vena umbilicalis become a ligament; I, the ductus communis choledochus; K, the canalis venoſus, now performing the office of a ligament; L, the trunk of the vena cava deſcendens; *a*, a ſmall portion of the membrane inveſting the liver; *b*, that part of the diaphragm which ſurrounds the vena cava; *c*, the biliary duct; *d*, the cyſtic duct; *e*, the place where theſe veſſels meet; *f*, the hepatic artery; *o*, *o*, the hepatic nerves; *p*, *p*, *p*, *p*, the common capſula laid open; *q*, *q*, the lymphæducts; *m*, *m*, *m*, &c. the ſmaller branches of the vena portæ;

portæ; *n*, *n*, *n*, *&c.* the ſmall branches of the vena cava.

Inflammation of the LIVER. See the article INFLAMMATION.

LIVER *of ſulphur*, &c. See HEPAR.

LIVER-WORT, *lichen*, in botany. See the article LICHEN.

LIVERPOOL, or LEVERPOOL, a port-town of Lancaſhire, fifteen miles north of Cheſter, which ſends two members to parliament.

LIVERY, in matters of dreſs and equipage, a certain colour and form of dreſs, by which noblemen and gentlemen chooſe to diſtinguiſh their ſervants.

LIVERY *of ſeiſin*, in law, ſignifies delivering the poſſeſſion of lands, *&c.* to him who has a right to them. There are two kinds of livery and ſeiſin; livery in law, where the feoffer being in view of the land, houſe, or other thing granted, ſays to the feoffee on delivery of the deed, "I give to you yonder land, *&c.* "to hold to you and your heirs, ſo go "into the ſame, and take poſſeſſion ac-"cordingly." And livery in deed, is where the parties, or the attornies by them authorized, coming to the door of the houſe, or upon ſome part of the land, declare the occaſion of their meeting before witneſſes, read the deed, or its contents, and in caſe it be made by attorney, the letter of attorney is alſo read, after which, if the delivery be of a houſe, the grantor, or his attorney, takes the ring, key, or latch belonging to the door, or if it be land, a turf, or clod of earth, and a twig of one of the trees, and delivering them with the deed to the grantee or his attorney, ſays, "I A. B. do "hereby deliver to you poſſeſſion and "ſeiſin of this meſſuage or tenement, "*&c.* to hold to you, your heirs and "aſſigns, according to the purport, true "intent, and meaning of this indenture, "or deed of feoffment." After which the grantee enters firſt alone, and ſhutting the door, and then opening it, lets in others.

When both a houſe and lands are conveyed, the houſe is looked upon as principal, and therefore the livery is made there. If lands lie in different parts of the ſame county, the livery and ſeiſin of one part in one place, in the name of the whole granted in the feoffment, is ſufficient; yet when they lie in different counties, livery and ſeiſin muſt be made in each. If a perſon grants a leaſe for years, with remainder to another for life, or in tail, *&c.* the livery and ſeiſin muſt be made to the leſſee for years, without which nothing will paſs to the perſon in remainder.

Since the making the ſtatute of uſes, livery and ſeiſin are not ſo much uſed as formerly; for a leaſe and releaſe, a bargain and ſale by deed inrolled, are ſufficient to veſt the grantee with poſſeſſion, without the formality of livery.

LIVERYMEN, of London, are a number of men choſen from among the freemen of each company. Out of this body the common council, ſheriff, and other ſuperior officers for the government of the city are elected, and they alone have the privilege of giving their votes for members of parliament; from which the reſt of the citizens are excluded.

LIVONIA, a province of Ruſſia, 160 miles long, and 120 broad; bounded by the gulph of Finland, on the north; by Ingria and great Novogorod, on the eaſt; by Lithuania and Courland, on the ſouth; and by the Baltic, on the weſt: its chief towns are Narva, Revel, and Riga.

LIVONICA TERRA, in the materia medica, a kind of fine bole uſed in the ſhops of Germany and Italy, of which there are two ſpecies, the yellow, and the red; the diſtinguiſhing characters of which are theſe: the yellow livonian earth is a pure and perfectly fine bole, of a ſhattery, friable texture, conſiderably heavy, and of a dull, duſky yellow, which has uſually ſome faint bluſh of reddiſhneſs in it: it is of a ſmooth ſurface, and does not ſtain the hands; it adheres firmly to the tongue, and melts freely in the mouth, leaving no grittineſs between the teeth, and does not ferment with acid menſtrua. The red livonian earth is an impure bole, of a looſe texture, and of a pale red: it is of a ſmooth ſurface, breaks eaſily between the fingers, and does not at all ſtain the hands; it melts freely in the mouth, has a very ſtrongly aſtringent taſte, but leaves a grittineſs between the teeth, and does not ferment with acid menſtrua. Theſe earths are both dug out of the ſame pit, in the place from whence they have their name, and in ſome other parts of the world. They are generally brought to us made up into little cakes, and ſealed with the impreſſion of a church, and an eſcutcheon with two croſs keys. In Spain and Portugal they are much uſed, ſometimes ſingly, ſometimes mixed together, and are good in fevers and in fluxes of all kinds. The red is the more power-

ful aſtringent. The Spaniards and Portugueze make alſo a light kind of earthen ware of them.

LIVRE, a french money of account, containing twenty ſols. See the articles COIN and MONEY.

LIXIVIOUS, an appellation given to ſalts, obtained from burnt vegetables by lotion. See the article SALT.

LIXIVIUM, in pharmacy, &c. a ley, obtained by pouring ſome liquor upon the aſhes of plants; which is more or leſs powerful, as it has imbibed the fixed ſalts contained in the aſhes.

Lixiviums are not only uſeful in medicine, but in many manufactures, dyeing, bleaching, &c. See DYEING and BLEACHING.

The lixivium ſaponarium, or ſoap leys, is a form of medicine mentioned in the London diſpenſatory, and ordered to be made in the following manner: Take equal weights of ruſſia-potaſh, and quick-lime, and throw water upon them by degrees, till the lime is ſlacked; then throw on more water, and ſtir all together, that the ſalt of the aſhes may be diſſolved; after ſome time pour the liquor, filtered through paper, if needful, into another veſſel. It is much uſed in caſes of the ſtone.

LIZARD, *lacerta*, in zoology, a genus of amphibious animals, the body of which is oblong and rounded, the legs four, and the hinder part terminated by a tapering tail.

The ſpecies of lizards are very numerous, being diſtinguiſhed chiefly by the number of their toes. See plate CLXII. fig. 1. where, n° 1. repreſents the long-tailed lizard, called from the fierceneſs of its aſpect, the lion-lizard; and n° 2. another lizard with five toes on each foot, and a long and rounded tail, and plicated ſides.

LIZARD, in geography, a cape, or promontary of Cornwall, fifteen miles ſouth of Falmouth: weſt long. 5° 47′, north lat. 49° 50′.

LOACH the engliſh name of a fiſh, called by Artedi, the ſmooth ſpotted cobitis, with a cylindrical body. See COBITIS.

LOAD, among miners, denotes a vein of ore. See the article MINE.

It is alſo uſed for nine diſhes of ore. See the article DISH.

LOADSTONE, the ſame with magnet. See the article MAGNET.

LOAMS, in natural hiſtory, are defined to be earths compoſed of diſſimilar particles, hard, ſtiff, denſe, and hard and rough to the touch; not eaſily ductile while moiſt, readily diffuſible in water, and compoſed of ſand, and a tough viſcid clay. Of theſe loams, ſome are whitiſh, and others brown or yellow.

LOBE, in anatomy, any fleſhy protuberant part, as the lobes of the lungs, lobes of the ears, &c. See LUNGS and EAR.

LOBELIA, in botany, a genus of the ſyngeneſia-polygamia claſs of plants, the flower of which is monopetalous, and ſlightly ringent: the fruit is an oval capſule, containing a great number of very ſmall ſeeds.

LOCAL, in law, ſomething fixed to the freehold, or tied to a certain place: thus real actions are local, ſince they muſt be brought in the country where they lie; and local cuſtoms are thoſe peculiar to certain countries and places.

LOCAL COLOURS, in painting, ſuch as are natural, and proper for each object in a picture. See the article PICTURE.

LOCAL MEDICINES, thoſe deſtined to act upon particular parts: ſuch are fomentations, epithems, veſicatories, &c. See the article FOMENTATION, &c.

LOCAL PROBLEM, among mathematicians, ſuch a one as is capable of an infinite number of different ſolutions, by reaſon that the point which is to reſolve the problem may be indifferently taken within a certain extent, as ſuppoſe any where, within ſuch a line, within ſuch a plane figure, &c. which is called a geometric locus, and the problem is ſaid to be a local or indetermined one. See LOCUS.

A local problem may be either ſimple, when the point ſought is in a right line; plane, when the point ſought is in the circumference of a circle; ſolid, when the point required is in the circumference of a conic ſection; or laſtly, ſurſolid, when the point is in the perimeter of a line of the ſecond gender, or of an higher kind, as geometers call it.

LOCATELLUS's BALSAM, in pharmacy, a celebrated balſam, the preparation whereof is directed in the London diſpenſatory as follows: Take of oil-olive, one pint; Straſburg turpentine and yellow wax, each half a pound; red ſaunders, ſix drams; melt the wax over a gentle fire, with ſome part of the oil; then add the reſt of the oil and the turpentine; afterwards mix in the ſaunders, and keep them ſtirring together until the mixture is grown cold. The Edinburgh diſpenſatory directs it to be made thus: Take of yellow wax, one pound; oil-olive, a pint and a half; Venice turpentine, a pound

pound and a half; balſam of Peru, two ounces; dragon's blood, one ounce; melt the wax in the oil over a gentle fire; then add the turpentine, and having taken them from the fire, mix in the balſam of Peru and dragon's blood, keeping them continually ſtirring till grown cold.

This balſam is uſed in internal bruiſes and hæmorrhages, eroſions of the inteſtines, ulcerations of the lungs, dyſenteries, and in ſome coughs and aſthmas; the doſe is from two ſcruples to two drams; it may be commodiouſly exhibited along with about double its weight of conſerve of roſes: ſome have likewiſe applied it externally, for deterging and incarnating recent wounds and ulcers.

LOCHABER. See LOQUABYR.

LOCHIA, in medicine, a flux from the uterus, conſequent to delivery. See the article DELIVERY.

This flux proceeds from the appendices cæcæ, after the ſeparation of the placenta, and is uſeful and even neceſſary to unload the veſſels of the womb: it is at firſt bloody, and retains a ſanguine colour for three or four days, till at length it becomes like the waſhings of fleſh. In ten or twelve days it is milky, and at laſt lymphatic: though, in ſome, it continues but twelve hours, in others twenty-four.

After delivery, therefore, the woman ſhould be put to bed, and a folded ſheet put under her to receive the lochia: warm linen ſhould alſo be applied to the genital parts, to keep out the air; and a compreſs, dipt in warm wine, ſhould be applied to the belly, but not too tight. When the flux of the lochia is moderate, it requires no aſſiſtance; but if immoderate, which very frequently happens, it is attended with weakneſs, loathing, fainting, convulſions, a ſlow, weak, or intermitting pulſe, exceſſive paleneſs, dimneſs of ſight, and a tingling in the ears. In this caſe, Aſtruc directs bleeding; and if any part of the placenta remains in the womb, it ſhould be ſearched for, and taken out. Internally attemperating medicines are to be given, to quiet the commotion of the blood: ſuch are nitre, crabs-eyes, cinnabar, and other alkaline abſorbents; and if theſe are inſufficient, the milder aſtringents are to be called in. Sydenham recommends an incraſſating diet, and the following drink: mix equal quantities of plantain-water, and red wine, which boil down one third, ſweetening it with ſugar; and of this, when cold, let the patient drink half a pound twice or thrice a-day.

If an immoderate flux of the lochia be dangerous, a ſuppreſſion of it is more ſo; the abdomen ſwells; the breathing is difficult; and faintings, cold ſweats, and the rigours of acute fevers ſupervene. In this caſe, if the patient's ſtrength will permit, let blood, and give her an emollient and diluent ptiſan of althæa, as alſo emollient clyſters; applying fomentations of marſh-mallows on the region of the uterus. If theſe give eaſe, you may preſcribe gentle aperitives, as ſaffron taken like tea; and her feet ſhould be bathed in warm water. If the flux is only diminiſhed, you may give tincture of myrrh, amber, and ſaffron, together or ſingle, in ſmall doſes, in tea, often in a day, or elixir proprietatis. If the lochia are quite ſuppreſſed, there is almoſt always a fever; in which caſe, all forcing medicines are unſafe; and therefore bleeding in the foot, in plethoric perſons, will be proper, with attemperating, abſorbent, and nitrous powders, diaphoretic potions, and aqueous liquors, as in acute fevers. See the article FEVER.

LOCHMABEN, a town of Scotland, fifteen miles eaſt of Dumfries.

LOCK, an inſtrument uſed for faſtening doors, cheſts, &c. generally opened by a key. See the article KEY.

The lock is eſteemed the maſter-piece in ſmithery; much art and delicacy being required in contriving and varying the wards, bolts and ſprings. From the different ſtructure of locks, accommodated to their different uſe, they acquire different names: thus thoſe placed on outer doors are called ſtock-locks; thoſe on inner doors, ſpring-locks; thoſe on trunks, trunk-locks, pad-locks, &c. Of theſe the ſpring-lock is the moſt curious: its principal parts are, the main-plate, the cover-plate, and the pin-hole: to the main plate belong the key-hole, top-hook, croſs-wards, bolt-toe, or bolt-nab, drawback ſpring, tumbler, pin of the tumbler, and the ſtaples; to the cover-plate belong the pin, main-ward, croſs-ward, ſtep-ward, or dapper-ward; to the pin-hole belong the hook-ward, main croſs-ward, ſhank, the pot or bread, bit, and bow-ward. The importation of locks is prohibited.

LOCKMAN, an officer in the Iſle of Man, who executes the orders of the government, much like our under ſheriff.

LOCRIDA,

LOCRIDA, a town of Turky in Europe, seventy miles south-east of Durazzo: east long. 21°, north lat. 41°.

LOCUS GEOMETRICUS, denotes a line, by which a local or indeterminate problem is solved. See LOCAL PROBLEM.

A locus is a line, any point of which may equally solve an indeterminate problem. Thus, if a right line suffice for the construction of the equation, it is called *locus ad rectum*; if a circle, *locus ad circulum*; if a parabola, *locus ad parabolam*; if an ellipsis, *locus ad ellipsin*; and so of the rest of the conic sections.

The loci of such equations as are right lines, or circles, the antients called *plain loci*; and of those that are parabolas, hyperbolas, &c. *solid loci.* But Wolfius, and others, among the moderns, divide the loci more commodiously into orders, according to the numbers of dimensions to which the indeterminate quantities rise. Thus, it will be a locus of the first order, if the equation is $x = \frac{ay}{c}$; a locus of the second or quadratic order, if $y^2 = ax$, or $y^2 = a^2 - x^2$; a locus of the third or cubic order, if $y^3 = a^2x$, or $y^3 = ax^2 - x^3$, &c.

The better to conceive the nature of the locus, suppose two unknown and variable right lines A P, P M (plate CLIX. fig. 4. n° 1, 2.) making any given angle A P M with each other; the one whereof, as A P, we call x, having a fixed origin in the point A, and extending itself indefinitely along a right line given in position; the other PM, which we call y, continually changing its position, but always parallel to itself. An equation only containing these two unknown quantities x and y, mixed with known ones, which expresses the relation of every variable quantity AP (x) to its correspondent variable quantity P M (y): the line passing through the extremities of all the values of y, *i. e.* through all the points M, is called a *geometrical locus*, in general, and the locus of that equation in particular.

All equations, whose loci are of the first order, may be reduced to some one of the four following formulas: 1. $y = \frac{bx}{a}$. 2. $y = \frac{bx}{a} + c$. 3. $y = \frac{bx}{a} - c$. 4. $y = c - \frac{bx}{a}$. Where the unknown quantity y, is supposed always to be freed from fractions, and the fraction that multiplies the other unknown quantity x, to be reduced to this expression $\frac{b}{a}$, and all the known terms to c.

The locus of the first formula being already determined: to find that of the second, $y = \frac{bx}{a} + c$; in the line AP, (n° 3.) take A B $= a$, and draw B E $= b$, A D $= c$ and parallel to P M. On the same side A P, draw the line A E of an indefinite length towards E, and the indefinite straight line D M parallel to A E. Then the line D M is the locus of the aforesaid equation, or formula; for if the line M P be drawn from any point M thereof parallel to A Q, the triangles A B E, and A P F, will be similar: and therefore A B (a) : BE (b) :: AP (x) P F $= \frac{bx}{a}$; and consequently P M $(y) = $ P F $\left(= \frac{bx}{a}\right)$ + F M $(c.)$

To find the locus of the third form, $y = \frac{bx}{a} - c$, proceed thus: assume AB $= a$ (n° 4.); and draw the right lines B E $= b$, A D $= c$ and parallel to PM, the one on one side A P, and the other on the other side: and through the points A, E, draw the line A E of an indefinite length towards E, and thro' the point D, the line D M parallel to A E: then the indefinite right line GM shall be the locus sought; for we shall have always PM $= (y) =$ PF $= \left(\frac{bx}{a}\right) -$ F M (c).

Lastly, to find the locus of the fourth formula, $y = c - \frac{bx}{a}$; in A P (n° 5.) take A B $= a$, and draw BE $= b$, A D $= c$, and parallel to P M, the one on one side AP, and the other on the other side; and through the points A, and E, draw the line A E indefinitely towards E, and through the point D draw the line D M parallel to A E. Then DG shall be the locus sought; for if the line M P be drawn from any point M thereof, parallel to A Q, then we shall always have P M $=$ F M $-$ P F, that is $y = c - \frac{bx}{a}$.

Hence it appears, that all the loci of the first degree are straight lines; which may be easily found, because all their equations

tions may be reduced to ſome one of the foregoing formulas.

All loci of the ſecond degree are conic ſections, *viz.* either the parabola, the circle, ellipſis, or hyperbola: if an equation therefore be given, whoſe locus is of the ſecond degree, and it be required to draw the conic ſection, which is the locus thereof; firſt draw a parabola, ellipſis, or hyperbola; ſo as that the equations expreſſing the natures thereof may be as compound as poſſible. In order to get general equations, or formulas, by examining the peculiar properties whereof we may know which of theſe formulas the given equation ought to have regard to; that is, which of the conic ſections will be the locus of the propoſed equation. This known, compare all the terms of the propoſed equation with the terms of the general formula of that conic ſection, which you have found will be the locus of the given equation; by which means you will find how to draw the ſection, which is the locus of the equation given.

For example; let $AP = x$, $PM = y$, be unknown, and variable ſtraight lines (n° 6.); and let m, n, p, r, s, be given right lines: in the line AP take $AB = m$, and draw $BE = n$, $AD = r$ and parallel to PM; and through the point A draw $AE = e$, and through the point D the indefinite right line DG parallel to AE. In DG take $DC = s$, and with CG, as a diameter, having its ordinates parallel to PM, and the line $CH = p$, as the parameter, deſcribe a parabola CM: then the portion thereof, included in the angle PAD, will be the locus of the following general formula:

$$yy - \frac{2nxy}{m} + \frac{nnxx}{mm} - 2ry + \frac{2nrx}{m} + rr - \frac{epx}{m} + ps. = o.$$

For if from any point M of that portion there be drawn the right line MP, making any angle APM with MP; the triangles ABE, APF, ſhall be ſimilar; therefore, AB : AE :: AP : AF or DG; that is, $m : e :: x : \frac{ex}{m}$. And AB : BE :: AP : PF; that is, $m : n :: x : \frac{nx}{m}$. And conſequently GM or PM — PF — FG $= y - \frac{nx}{m} - r$. And CG or DG — DC $= \frac{ex}{m} - s$. But from the nature of the parabola $GM^2 = CG \times CH$; which equation will become that of the general formula, by putting the literal values of thoſe lines.

Again, if through the fixed point A you draw the indefinite right line AQ (n° 7.) parallel to PM, and you take $AB = m$, and draw $BE = n$ and parallel to AP, and thro' the determinate points A, E, the line $AE = e$; and if in AP you take $AD = r$: and draw the indefinite ſtraight line DG parallel to AE, and take $DC = s$: This being done, if with the diameter CG, whoſe ordinates are parallel to AP, and parameter the line $CH = p$, you deſcribe a parabola CM; the portion of this parabola contained in the angle BAP ſhall be the locus of this ſecond equation, or formula:

$$xx - \frac{2nyx}{m} + \frac{nnyy}{mm} - 2rx + \frac{2nry}{m} + rr - \frac{epy}{m} + ps. = o.$$

For if the line MQ be drawn from any point M, therein, parallel to AP; then will, AB : AE :: AQ or PM : AF or DG; that is, $m : e :: y : \frac{ey}{m}$; and AB : BE :: AQ : QF; that is, $m : n :: y : \frac{ny}{m}$. And therefore GM or QM — QF — FG $= x - \frac{ny}{m} - r$; and CG or DG — DC $= \frac{ey}{m} - s$.

And ſo by the common property of the parabola, you will have the foregoing ſecond equation, or formula. So likewiſe may be found general equations for the other conic ſections.

Now if it be required to draw the parabola, which we find to be the locus of this propoſed equation $yy - 2ay - bx + cc = o$; compare every term of the firſt formula with the terms of the equation, becauſe yy in both is without fractions; and then will $\frac{2n}{m} = o$, becauſe the rectangle xy not being in the propoſed equation, the ſaid rectangle may be eſteemed as multiplied by o; whence $n = o$, and $m = e$; becauſe the line AE falling in AB, that is, in AP in the conſtruction of the formula, the points B, E, do coincide. Therefore deſtroying all the terms adfected with $\frac{n}{m}$ in the formula, and ſubſtituting m for e, we ſhall get yy

—2

$-2ry-px+rr+ps=o$. Again, by comparing the correspondent terms $-2ry$ and $-2ay$, as also $-px$ and $-bx$, we have $r=a$, and $p=b$; and comparing the terms wherein are neither of the unknown quantities x, y, we get $rr+ps=cc$; and substituting a and b, for r and p, then will $s=\frac{cc-aa}{b}$, which is a negative expression when a is greater than c, as is here supposed. There is is no need of comparing the first terms yy and yy, because they are the same. Now the values of n, r, p, s, being thus found, the sought locus may be constructed by means of the construction of the formula, and after the following manner.

Because $BE=n=o$ (nº 8.) the points B, E, do coincide, and the line AE falls in AP; therefore thro' the fixed point A draw the line $AD=r=a$ parallel to PM, and draw DG parallel to AP, in which take $DC=\frac{aa-cc}{b}=-s$; then with DC, as a diameter, whose ordinates are right lines parallel to PM, and parameter the line $CH=p=b$, describe a parabola: then the two portions OMM, RMS, contained in the angle PAO, formed by the line AP, and the line AO drawn parallel to PM, will be the locus of the given equation, as is easily proved.

If in a given equation whose locus is a parabola, xx is without a fraction; then the term of the second formula must be compared with those of the given equation.

Thus much for the method of constructing the loci of the equations which are conic sections. If, now, an equation, whose locus is a conic section, be given, and the particular section whereof it is the locus be required: all the terms of the given equation being brought over to one side, so that the other be equal to nothing, there will be two cases.

Case I. When the rectangle xy is not in the given equation. 1. If either yy or xx be in the same equation, the locus will be a parabola. 2. If both xx and yy are in the equation with the same signs, the locus will be an ellipsis, or a circle. 3. If xx and yy have different signs, the locus will be an hyperbola, or the opposite sections regarding their diameters.

Case II. When the rectangle xy is in the given equation. 1. If neither of the squares xx or yy, or only one of them, be in the same, the locus of it will be an hyperbola between the asymptotes. 2. If yy and xx be therein, having different signs, the locus will be an hyperbola regarding its diameters. 3. If both the squares xx and yy are in the equation, having the same signs, you must free the square yy from fractions; and then the locus will be an hyperbola, when the square of $\frac{1}{2}$ the fraction multiplying xy, is equal to the fraction multiplying xx, an ellipsis, or circle, when the same is less; and an hyperbola, or the opposite sections, regarding their diameters, when greater.

LOCULAMENT, among botanists, denotes a cell, or partition, in a seed-pod, for the seed of a plant. See PLANT.

In one plant we meet with one loculament in a pod; in others, with two, three, or more.

LOCUST, *locusta*, in zoology, the name of several species of gryllus. See the article GRYLLUS.

The great green locust, with a straight ensiform tail, is near two inches in length, and about the thickness of a man's little finger; it is common in pastures, in many parts of Europe; and is called by authors, locusta viridis major.

The country of the Cossacks, in dry summers, is much infested with prodigious swarms of locusts; which devour all the corn and pasture.

LOCUST-TREE, in botany, a name by which the people of the West-Indies call a species of acacia. See ACACIA.

LODGMENT, in military affairs, is a work raised with earth, gabions, fascines, wool-packs, or mantelets, to cover the besiegers from the enemies fire, and to prevent their losing a place which they have gained, and are resolved, if possible, to keep. For this purpose, when a lodgment is to be made on the glacis, covert-way, or in a breach, there must be great provision made of fascines, sand-bags, &c. in the trenches; and during the action, the pioneers with fascines, sand-bags, &c. should be making the lodgment, in order to form a covering in as advantageous a manner as possible from the opposite bastion, or the place most to be feared.

LOEFLINGIA, in botany, a genus of the triandria monogynia class of plants, the calyx of which is a five-leafed, erect perianthium; the corolla consists of five very small, oblong, oval petals, forming a globe: the fruit is an oval, three-cornered capsule, composed of three

Fig. 1. The LIVER of a Fœtus

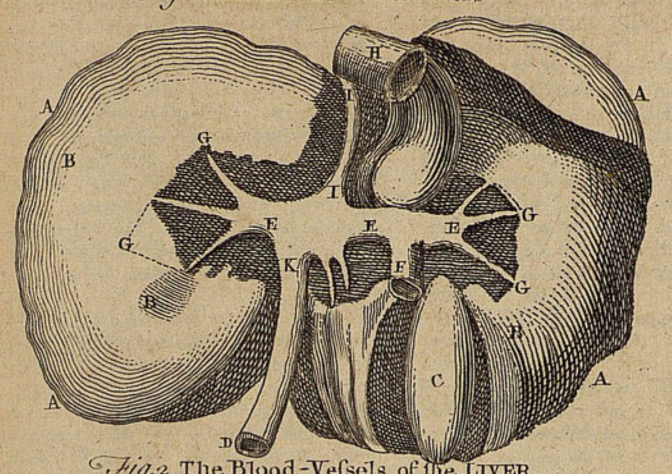


Fig. 2. The Blood-Vessels of the LIVER, together with the Gall-Bladder

T. Jefferys sculp

three valves, and containing three cells; the feeds are numerous and oval.

LOESELIA, in botany, a genus of the didynamia-angiofpermia clafs of plants, the flower of which is monopetalous, and quinquifid at the limb: the fruit is a trilocular capfule, with feveral angulated feeds in each cell.

LOG, in naval affairs, is a flat piece of wood, fhaped fomewhat like a flounder, with a piece of lead faftened to its bottom, which makes it ftand or fwim upright in the water. See plate CLXII. fig. 2.

To this log is faftened a long line, called the log-line; and this is commonly divided into certain fpaces fifty feet in length, by knots, which are pieces of knotted twine, inreeved between the ftrands of the line; which fhew, by means of an half minute glafs, how many of thefe fpaces or knots are run out in half a minute. They commonly begin to be counted at the diftance of about ten fathoms, or fixty feet from the log; that fo the log, when it is hove over-board, may be out of the eddy of the fhip's wake before they begin to count, and for the ready difcovery of this point of commencement, there is commonly faftened at it a red rag.

The log being thus prepared, and hove over-board from the poop, and the line veered out by the help of a reel, as faft as the fhip fails from it, will fhew how far the fhip has run in a given time; and confequently her rate of failing.

Hence it is evident, that as the diftance of the knots bears the fame proportion to a mile, as half a minute does to an hour, whatever number of knots the fhip runs in half a minute, the fame number of miles fhe will run in an hour, fuppofing her to run with the fame degree of velocity during that time; and therefore, in order to know her rate of failing, it is the general way to heave the log every hour; but if the force or direction of the wind vary, and does not continue the fame during the whole hour, or if there has been more fail fet, or any fail handed in, by which the fhip has failed fafter or flower than fhe did at the time of heaving the log, there muft then be an allowance made for it accordingly.

LOG BOARD, a table generally divided into five columns, in the firft of which is entered the hour of the day; in the fecond, the courfe fteered; in the third, the number of knots ran off the reel each time of heaving the log; in the fourth, from what point the wind blows; and in the fifth, obfervations on the weather, variation of the compafs, *&c.*

LOG-BOOK, a book ruled in columns like the log-board, into which the account on the log-board is tranfcribed every day at noon; from whence, after it is corrected, *&c.* it is entered into the journal.

LOG-WOOD, in commerce, the wood of a tree called, by botanifts, hæmatoxylum. See the article HÆMATOXYLUM.

Logwood is ufed by dyers, for dyeing blacks and blues.

LOGARITHMIC, in general, fomething belonging to logarithms. See the article LOGARITHMS.

LOGARITHMIC CURVE. If on the line AN (plate CLII. fig. 3.) both ways indefinitely extended, be taken, AC, CE, EG, GI, IL, on the right hand. And alfo A*g*, *g* P, *&c.* on the left, all equal to one another. And, if at the points P, *g*, A, C, E, G, I, L, be erected to the right line, AN, the perpendiculars PS, *g d*, AB, CD, EF, GH, IK, LM, which let be continually proportional, and reprefent numbers, *viz.* AB, 1; CD, 10, EF 100, *&c.* then fhall we have two progreffions of lines, arithmetical and geometrical: for the lines AC, AE, AG, *&c.* are in arithmetical progreffion, or as 1, 2, 3, 4, 5, *&c.* and fo reprefent the logarithms to which the geometrical lines AB, CD, EF, *&c.* do correfpond. For fince AG is triple of the right line AC, the number GH fhall be in the third place from unity, if CD be in the firft: fo, likewife, fhall LM be in the fifth place, fince AL = 5 AC. If the extremities of the proportionals S, *d*, B, D, F, *&c.* be joined by right lines, the figure SBML will become a polygon, confifting of more or lefs fides, according as there is more or lefs terms in the progreffion.

If the parts AC, CE, EG, *&c.* be bifected in the points *c*, *e*, *g*, *i*, *l*, and there be again raifed the perpendiculars *c d*, *e f*, *g h*, *i k*, *l m*, which are mean proportionals between AB, CD; CD, EF, *&c.* then there will arife a new feries of proportionals, whofe terms beginning from that which immediately follows unity, are double of thofe in the firft feries, and the difference of the terms are become lefs, and approach nearer to a ratio of equality than before. Likewife, in this new feries, the right lines AL, A*c*, exprefs the diftances of

of the terms L M, *c d*, from unity; *viz.* ſince A L is ten times greater than A *c*, L M ſhall be the tenth term of the ſeries from unity; and, becauſe A *e* is three times greater than A *c*, *e f* will be the third term of the ſeries if *c d* be the firſt, and there ſhall be two mean proportionals between A B and *e f*; and between A B and L M there will be nine mean proportionals. And if the extremities of the lines B *d*, D *f*, F *h*, &c. be joined by right lines, there will be a new polygon made, conſiſting of more but ſhorter ſides than the laſt.

If, in this manner, mean proportionals be continually placed between every two terms, the number of terms at laſt will be made ſo great, as alſo the number of the ſides of the polygon, as to be greater than any given number, or to be infinite; and every ſide of the polygon ſo leſſened, as to become leſs than any given right line; and conſequently the polygon will be changed into a curve-lined figure: for any curve-lined figure may be conceived as a polygon, whoſe ſides are infinitely ſmall and infinite in number. A curve deſcribed after this manner, is called logarithmical.

It is manifeſt from this deſcription of the logarithmic curve, that all numbers at equal diſtances are continually proportional. It is alſo plain, that if there be four numbers, AB, C D, I K, L M, ſuch that the diſtance between the firſt and ſecond, be equal to the diſtance between the third and the fourth; let the diſtance from the ſecond to the third be what it will, theſe numbers will be proportional. For becauſe the diſtances A C, I L, are equal, A B ſhall be to the increment D *s*, as I K is to the increment M T. Wherefore, by compoſition, A B : D C : : I K : M L. And, contrariwiſe, if four numbers be proportional, the diſtance between the firſt and ſecond ſhall be equal to the diſtance between the third and fourth.

The diſtance between any two numbers, is called the logarithm of the ratio of thoſe numbers; and, indeed, doth not meaſure the ratio itſelf, but the number of terms in a given ſeries of geometrical proportionals, proceeding from one number to another, and defines the number of equal ratios by the compoſition whereof the ratio of numbers are known.

LOGARITHMS, are the indexes or exponents (moſtly whole numbers and decimal fractions, conſiſting of ſeven places of figures at leaſt) of the powers or roots (chiefly broken) of a given number; yet ſuch indexes or exponents, that the ſeveral powers or roots they expreſs, are the natural numbers 1, 2, 3, 4, 5, &c. to 10 or 100000, &c. (as if the given number be 10, and its index be aſſumed 1 0000000, then the 0.0000000 root of 10, which is 1, will be the logarithm of 1; the 0.301036 root of 10, which is 2, will be the logarithm of 2; the 0.477121 root of 10 which is 3, will be the logarithm of 3; the 0.612060 root of 10, the logarithm of 4; the 1.041393 power of 10 the logarithm of 11; the 1.079181 power of 10 the logarithm of 12, &c.) being chiefly contrived for eaſe and expedition in performing of arithmetical operations in large numbers, and in trigonometrical calculations; but they have likewiſe been found of extenſive ſervice in the higher geometry, particularly in the method of fluxions. They are generally founded on this conſideration, that if there be any row of geometrical proportional numbers, as 1, 2, 4, 8, 16, 32, 64, 128, 256, &c. or 1, 10, 100, 1000, 10000, &c. And as many arithmetical progreſſional numbers adapted to them, or ſet over them, beginning with 0, thus,

0,	1,	2,	3,	4,	5,	6,	7,	&c.
1,	2,	4,	8,	16,	32,	64,	128,	&c.

or,

0,	1,	2,	3,	4,	&c.
1,	10,	100,	1000,	10000,	&c.

Then will the ſum of any two of theſe arithmetical progreſſionals, added together, be that arithmetical progreſſional which anſwers to, or ſtands over the geometrical progreſſional, which is the product of the two geometrical progreſſionals over which the two aſſumed arithmetical progreſſionals ſtand: again, if thoſe arithmetical progreſſionals be ſubtracted from each other, the remainder will be the arithmetical progreſſional ſtanding over that geometrical progreſſional which is the quotient of the diviſion of the two geometrical progreſſionals belonging to the two firſt aſſumed arithmetical progreſſionals; and the double, triple, &c. of any one of the arithmetical progreſſionals, will be the arithmetical progreſſional ſtanding over the ſquare, cube, &c. of that geometrical progreſſional which the aſſumed arithmetical progreſſional ſtands over, as well as the $\frac{1}{2}$, $\frac{1}{3}$, &c. of that arithmetical progreſſional, will be the geometrical progreſſional anſwering to the ſquare root, cube root, &c. of the arithmetical progreſſional over it: and

from

from hence arifes the following common, though lame and imperfect definition of logarithms; *viz.*

That they are fo many arithmetical progreffionals, anfwering to the fame number of geometrical ones. Whereas, if any one looks into the tables of logarithms, he will find, that thefe do not all run on in an arithmetical progreffion, nor the numbers they anfwer to in a geometrical one; thefe laft being themfelves arithmetical progreffionals. Dr. Wallis, in his hiftory of algebra, calls logarithms, the indexes of the ratios of numbers to one another. Dr. Halley, in the Philofophical Tranfactions, n° 216, fays, they are the exponents of the ratios of unity to numbers. So, alfo, Mr. Cotes, in his Harmonia Menfurarum, fays, they are the numerical meafures of ratios: but all thefe definitions convey but a very confufed notion of logarithms. Mr. Maclaurin, in his Treatife of Fluxions, has explained the natural and genefis of logarithms, agreeably to the notion of their firft inventor, lord Naper. Logarithms then, and the quantities to which they correfpond, may be fuppofed to be generated by the motion of a point: and if this point moves over equal fpaces in equal times, the line defcribed by it increafes equally.

Again, a line decreafes proportionably, when the point that moves over it defcribes fuch parts in equal times as are always in the fame conftant ratio to the lines from which they are fubducted, or to the diftances of that point, at the beginning of thofe lines, from a given term in that line. In like manner, a line may increafe proportionably, if in equal times the moving point defcribes fpaces proportional to its diftances from a certain term at the beginning of each time. Thus, in the firft cafe, let *a c* (plate CLX. fig. 2. n° 1 and 2) be to *a o*, *c d* to *c o*, *d e* to *d o*, *e f* to *e o*, *f g* to *f o*, always in the fame ratio of Q R to Q S; and fuppofe the point P fets out from *a*, defcribing *a c*, *c d*, *d e*, *ef*, *fg*, in equal parts of the time; and let the fpace defcribed by P in any given time, be always in the fame ratio to the diftance of P from *o* at the beginning of that time, then will the right line *ao* decreafe proportionally.

In like manner, the line *o a*, (*ibid.* n° 3.) increafes proportionally, if the point *p*, in equal times, defcribes fpaces *a c*, *c d*, *de*, *ef*, *fg*, &c. fo that *a c* is to *a o*, *c d* to *c o*, *d e* to *d o*, &c. in a conftant ratio. If we now fuppofe a point P defcribing the line A G (*ibid.* n° 4.) with an uniform motion, while the point *p* defcribes a line increafing or decreafing proportionally, the line A P, defcribed by P, with this uniform motion, in the fame time that *o a*, by increafing or decreafing proportionally, becomes equal to *op*, is the logarithm of *op*. Thus A C, A D, A E. &c. are the logarithms of *o c*, *o d*, *o e*, &c. refpectively; and *o a* is the quantity whofe logarithm is fuppofed equal to nothing.

We have here abftracted from numbers, that the doctrine may be the more general; but it is plain, that if A C, A D, A E, &c. be fuppofed, 1, 2, 3, &c. in arithmetic progreffion; *o c*, *o d*, *o e*, &c. will be in geometric progreffion; and that the logarithm of *o a*, which may be taken for unity, is nothing.

Lord Naper, in his firft fcheme of logarithms, fuppofes, that while *o p* increafes or decreafes proportionally, the uniform motion of the point P, by which the logarithm of *o p* is generated, is equal to the velocity of *p* at *a*; that is, at the term of time when the logarithms begin to be generated. Hence logarithms, formed after this model, are called Naper's Logarithms, and fometimes Natural Logarithms.

When a ratio is given, the point *p* defcribes the difference of the terms of the ratio in the fame time. When a ratio is duplicate of another ratio, the point *p* defcribes the difference of the terms in a double time. When a ratio is triplicate of another, it defcribes the difference of the terms in a triple time; and fo on. Alfo, when a ratio is compounded of two or more ratios, the point *p* defcribes the difference of the terms of that ratio in a time equal to the fum of the times, in which it defcribes the differences of the terms of the fimple ratios of which it is compounded. And what is here faid of the times of the motion of *p* when *op* increafes proportionally, is to be applied to the fpaces defcribed by P, in thofe times, with its uniform motion.

Hence the chief properties of logarithms are deduced. They are the meafures of ratios. The excefs of the logarithm of the antecedent above the logarithm of the confequent, meafures the ratio of thofe terms. The meafure of the ratio of a greater quantity to a leffer is pofitive; as this ratio, compounded

with any other ratio, increaſes it. The ratio of equality, compounded with any other ratio, neither increaſes nor diminiſhes it; and its meaſure is nothing. The meaſure of the ratio of a leſſer quantity to a greater is negative; as this ratio, compounded with any other ratio, diminiſhes it. The ratio of any quantity A to unity, compounded with the ratio of unity to A, produces the ratio of A to A, or the ratio of equality; and the meaſures of thoſe two ratios deſtroy each other when added together; ſo that when the one is conſidered as poſitive, the other is to be conſidered as negative. By ſuppoſing the logarithms of quantities greater than *o a* (which is ſuppoſed to repreſent unity) to be poſitive, and the logarithms of quantities leſs than it to be negative, the ſame rules ſerve for the operations by logarithms, whether the quantities be greater or leſs than *o a*. When *o p* increaſes proportionally, the motion of *p* is perpetually accelerated; for the ſpaces *a c*, *c d*, *d e*, *&c.* that are deſcribed by it in any equal times that continually ſucceed after each other, perpetually increaſe in the ſame proportion as the lines *o a*, *o c*, *o d*, *&c.* When the point *p* moves from *a* towards *o*, and *o p* decreaſes proportionally, the motion of *p* is perpetually retarded; for the ſpaces deſcribed by it in any equal times that continually ſucceed after each other, decreaſe in this caſe in the ſame proportion as *o p* decreaſes.

If the velocity of the point *p* be always as the diſtance *o p*, then will this line increaſe or decreaſe in the manner ſuppoſed by lord Naper; and the velocity of the point *p* being the fluxion of the line *o p*, will always vary in the ſame ratio as this quantity itſelf. This, we preſume will give a clear idea of the geneſis, or nature of logarithms; but for more o this doctrine, ſee Maclaurin's Fluxions.

Conſtruction of LOGARITHMS. The firſt makers of logarithms, had in this a very laborious and difficult taſk to perform; they firſt made choice of their ſcale or ſyſtem of logarithms, that is, what ſet of arithmetical progreſſionals ſhould anſwer to ſuch a ſet of geometrical ones, for this is entirely arbitrary; and they choſe the decuple geometrical progreſſionals, 1, 10, 100, 1000, 10000, *&c.* and the arithmetical one, 0, 1, 2, 3, 4, *&c.* or 0,000000; 1,000000; 2,000000; 3,000000; 4,000000, *&c.* as the moſt convenient. After this they were to get the logarithms of all the intermediate numbers between 1 and 10, 10 and 100, 100 and 1000, 1000 and 10000, *&c.* But firſt of all they were to get the logarithms of the prime numbers 3, 5, 7, 11, 13, 17, 19, 23, *&c.* and when theſe were once had, it was eaſy to get thoſe of the compound numbers made up of the prime ones, by the addition or ſubtraction of their logarithms.

In order to this, they found a mean proportion between 1 and 10, and its logarithm will be $\frac{1}{2}$ that of 10; and ſo given, then they found a mean proportional between the number firſt found and unity, which mean will be nearer to 1 than that before, and its logarithm will be $\frac{1}{2}$ of the former logarithm, or $\frac{1}{4}$ of that of 10; and having in this manner continually found a mean proportional between 1 and the laſt mean, and biſſected the logarithms, they at length, after finding 54 ſuch means, came to a number 1,000000000000000001278191493200323442, ſo near to 1 as not to differ from it ſo much as $\frac{1}{100000000000000000}$ part, and found its logarithm to be

0.000000000000000005551115123125782702,

and

00000000000000000127819149320032335

to be the difference whereby 1 exceeds the number of roots or mean proportionals found by extraction; and then, by means of theſe numbers, they found the logarithms of any other numbers whatſoever; and that after the following manner: between a given number, whoſe logarithm is wanted, and 1, they found a mean proportional, as above, until at length a number (mixed) be found, ſuch a ſmall matter above 1, as to have 1 and 15 cyphers after it, which are followed by the ſame number of ſignificant figures; then they ſaid, as the laſt number mentioned above is to the mean proportional thus found, ſo is the logarithm above, *viz.*

0.000000000000000005551115123125782702

to the logarithm of the mean proportional number, ſuch a ſmall matter exceeding 1, as but now mentioned; and this logarithm being as often doubled as the number of mean proportionals, (formed to get that number) will be the logarithm of the given number. And this was the method Mr. Briggs took to make the logarithms. But if they are to be made to only ſeven places of figures, which are enough for common uſe, they had only occaſion to find 25 mean proportionals, or, which is the ſame thing,

thing, to extract the $\frac{1}{33554432}$th root of 10. Now having the logarithms of 3, 5, and 7, they easily got those of 2, 4, 6, 8 and 9; for since $\frac{10}{5} = 2$, the logarithm of 2 will be the difference of the logarithms of 10 and 5; the logarithm of 4 will be two times the logarithm of 2; the logarithm of 6 will be the sum of the logarithm of 2 and 3; and the logarithm of 9 double the logarithm of 3. So, also having found the logarithms of 13, 17 and 19, and also of 23 and 29, they did easily get those of all the numbers between 10 and 30, by addition and subtraction only; and so having found the logarithms of other prime numbers, they got those of other numbers compounded of them.

But since the way above hinted at, for finding the logarithms of the prime numbers is so intolerably laborious and troublesome, the more skilful mathematicians that came after the first inventors, employing their thoughts about abbreviating this method, had a vastly more easy and short way offered to them from the contemplation and mensuration of hyperbolic spaces contained between the portions of an asymptote, right lines perpendicular to it, and the curve of the hyperbola: for if E C N (pl. CLXII. fig. 4, n° 1.) be an hyperbola, and A D, A Q the asymptotes, and A B, A P, A Q, *&c.* taken upon one of them, be represented by numbers, and the ordinates B C, P M, Q N, *&c.* be drawn from the several points B, P, Q, *&c.* to the curve, then will the quadrilinear spaces B C M P, P M N Q, *&c. viz.* their numerical measures be the logarithms of the quotients of the division of A B by A P, A P by A Q, *&c.* since when A B, A P, A Q, *&c.* are continual proportionals, the said spaces are equal, as is demonstrated by several writers concerning conic sections. See HYPERBOLA.

Having said that these hyperbolic spaces, numerically expressed, may be taken for logarithms, we shall next give a specimen, from the great Sir Isaac Newton, of the method how to measure these spaces, and consequently of the construction of logarithms.

Let C A (*ibid.* n° 2.) = A F be = 1, and A B = A b = x; then will $\frac{1}{1+x}$ be = B D, and $\frac{1}{1-x} = b\,d$; and putting these expressions into serieses, it will be $\frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5$, *&c.* and $\frac{1}{1-x} = 1 + x + x^2 + x^3 + x^4 + x^5$, *&c.* and $\frac{\dot{x}}{1+x} = \dot{x} - x\dot{x} + x^2\dot{x} - x^3\dot{x} + x^4\dot{x} - x^5\dot{x}$, *&c.* and $\frac{\dot{x}}{1-x} = \dot{x} + x\dot{x} + x^2\dot{x} + x^3\dot{x} + x^4\dot{x} + x^5\dot{x}$, *&c.* and taking the fluents, we shall have the area AFDB $= x - \frac{xx}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5}$, *&c.* and the area A F $d\,b$, $= x + \frac{xx}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \frac{x^5}{5}$ *&c.* and the sum $b\,d$ D B $= 2x + \frac{2x^3}{3} + \frac{2}{5}x^5 + \frac{2}{7}x^7 + \frac{2}{9}x^9$, *&c.* Now if A B or $a\,b$ be $\frac{1}{10} = x$, C b being = 0.9, and C B = 1.1, by putting this value of x in the equations above, we shall have the area $b\,d$ D B = 0.2006706954621511 for the terms of the series will stand as you see in this table,

0.2000000000000000 = first		Term of the series.
6666666666666 = second		
40000000000 = third		
285714286 = fourth		
2222222 = fifth		
18182 = sixth		
154 = seventh		
1 = eighth.		
0.2006706954621511		

If the parts A d and A D of this area be added separately, and the lesser D A be taken from the greater d A, we shall have A d—AD $= x^2 + \frac{x^4}{2} + \frac{x^6}{3} + \frac{x^8}{4}$, *&c.* = 0.0100503358535014, for the terms reduced to decimals will stand thus:

0.0100000000000000 = first		Term of the series.
50000000000 = second		
3333333333 = third		
25000000 = fourth		
200000 = fifth		
1667 = sixth		
14 = seventh		
0.0100503358535014.		

Now if this difference of the areas be added to, and subtracted from their sum before found, half the aggregate, *viz.* 0.1053605156578263 will be the greater area A d. and half the remainder, *viz.* 0.0953101798043249, will be the lesser area A D.

By the same tables, these areas A D and A d, will be obtained also when A B = A b are supposed to be $\frac{1}{100}$ or C B = 1.01, and C b=0.99, if the numbers are but

but duly transferred to lower places, as

0.02000000000000000 = 1st.	Term of the series.
6666666666 = 2d.	
400000 = 3d.	
28 = 4th.	

Sum = 0.02000066670666694 = area b D.

0.0001000000000000 = first	Term of the series.
50000000 = second	
3333 = third	

0.0001000050003333 = area Ad—AD.
Half the aggregate 0.0100503358535014. = A d, and half the remainder, *viz.* 0.0099503308531681 = A D.
And so putting A B = A b = $\frac{1}{1000}$, or C B = 1.001 and C b = 0.999, there will be obtained Ad = 0.0010005000333583 5, and A D = 0.000999500133330835.
After the same manner, if A B = A b, be = 0.2, or 0.02, or 0.002, these areas will arise.
A d = 0.2231435513142097, and
A D = 0.1823215576939546, or
A d = 0.0202027073175194, and
A D = 0.1098026272961797, or
A d = 0.002002, and A D = 0.001.
From these areas, thus found, others may be easily had from addition and subtraction only. For since $\frac{1.2}{0.8} \times \frac{1.2}{0.9} = 2$, the sum of the areas belonging to the ratios $\frac{1.2}{0.8}$ and $\frac{1.2}{0.9}$, (that is, insisting upon the parts of the abscis 1.2, 0.8; and 1.2, 0.9) *viz.* 0.405465, &c. and $\begin{cases} \text{A D} = 0.18232, \&c. \\ \text{A } d = 0.10536, \&c. \end{cases}$

Sum = 0.28768, &c.

added thus, $\begin{cases} 0.40546, \&c. \\ 0.28768, \&c. \end{cases}$

Total = 0.69314, &c. = the area of A F H G, when C G is = 2. Also since $\frac{1.2}{0.8} \times 2 = 3$, the sum 1.0986122, &c. of the areas belonging to $\frac{1.2}{0.8}$ and 2, will be the area of A F G H, when C G = 3. Again, since $\frac{2 \times 2}{0.8} = 5$, and 2 × 5 = 10; by adding A d = 0.2231, &c. A D = 0.1823, &c. and A d = 0.1053, &c. together, their sum is 0.5108, &c. and this added to 1.0986, &c. the area of A F G H, when C G = 3. You will have 1.6093379124341004 = A F G H, when C G is 5; and adding that of 2 to this, gives 2.302585092994045 7 = A F G H, when C G is equal to 10: and since 10 × 10 = 100; and 10 × 100 = 1000; and $\sqrt{5 \times 10 \times 0.98} = 7$, and 10 × 1.1 = 11, and $\frac{1000 \times 1.091}{7 \times 11} = 13$, and $\frac{1000 \times 0.998}{2} = 499$; it is plain that the area A F G H may be found by the composition of the areas found before, when C G = 100, 1000, or any other of the numbers above mentioned; and all these areas are the hyperbolic logarithms of those several numbers.
Having thus obtained the hyperbolic logarithms of the numbers 10, 0.98, 0.99, 1.01, 1.02; if the logarithms of the four last of them be divided by the hyperbolic logarithm 2.3025850, &c. of 10, and the index 2, be added; or, which is the same thing, if it be multiplied by its reciprocal 0.4342944819032518, the value of the subtangent of the logarithmic curve, to which Briggs's logarithms are adapted, we shall have the true tabular logarithms of 98, 99, 100, 101, 102. These are to be interpolated by ten intervals, and then we shall have the logarithms of all the numbers between 980 and 1010; and all between 980 and 1000, being again interpolated by ten intervals, the table will be as it were constructed. Then from these we are to get the logarithms of all the prime numbers, and their multiples less than 100, which may be done by addition and subtraction only: for $\frac{\sqrt[10]{84 \times 1020}}{9945} = 2$; $\frac{\sqrt[4]{8 \times 9963}}{984} = 3$; $\frac{10}{2} = 5$; $\frac{\sqrt{98}}{2} = 7$; $\frac{99}{9} = 11$; $\frac{1001}{7 \times 11} = 13$; $\frac{102}{6} = 17$; $\frac{988}{4 \times 13} = 19$; $\frac{9936}{16 \times 27} = 23$; $\frac{986}{2 \times 17} = 29$; $\frac{992}{32} = 31$; $\frac{999}{27} = 37$; $\frac{984}{24} = 41$; $\frac{989}{23} = 43$; $\frac{987}{21} = 47$; $\frac{9911}{11 \times 17} = 53$; $\frac{9971}{13 \times 13} = 59$; $\frac{9882}{2 \times 81} = 61$; $\frac{9949}{3 \times 49} = 67$; $\frac{994}{14} = 71$; $\frac{9928}{8 \times 17} = 73$; $\frac{9954}{7 \times 18} = 79$; $\frac{996}{12} = 83$; $\frac{9968}{7 \times 16} = 89$; $\frac{9894}{6 \times 17} = 97$; and thus having the logarithms of all the numbers less than 100, you have nothing to do but interpolate the several times, through ten intervals.

Now

Now the void places may be filled up by the following theorem. Let n be a number, whose logarithm is wanted; let x be the difference between that and the two neareſt numbers, equally diſtant on each ſide, whoſe logarithms are already found; and let d be half the difference of their logarithms: then the required logarithm of the number n, will be had by adding $d+\frac{dx}{2n}+\frac{dx^3}{12n^3}$, &c. to the logarithm of the leſſer number: for if the numbers are repreſented by Cp, C G, C P (*ib.* n° 2.) and the ordinates ps, P Q, be raiſed; if n be wrote for C G, and x for G P, or Gp, the area ps Q P, or $\frac{2x}{n}+\frac{x^2}{2n^2}+\frac{x^3}{3n^3}$, &c. will be to the area ps H G, as the difference between the logarithms of the extreme numbers, or $2d$, is to the difference between the logarithms of the leſſer, and of the middle one; which, therefore, will be

$$\frac{\frac{dx}{n}+\frac{dx^2}{2n}+\frac{dx^3}{3n}, \&c.}{\frac{x}{n}+\frac{x^3}{3n}+\frac{x^5}{5n}, \&c.}=d+\frac{dx}{2n}+\frac{dx^3}{12n^3}, \&c.$$

The two firſt terms $d+\frac{dx}{2n}$ of this ſeries, being ſufficient for the conſtruction of a canon of logarithms, even to 14 places of figures, provided the number, whoſe logarithm is to be found, be leſs than 1000; which cannot be very troubleſome, becauſe x is either 1 or 2: yet it is not neceſſary to interpolate all the places by help of this rule, ſince the logarithms of numbers, which are produced by the multiplication or diviſion of the number laſt found, may be obtained by the numbers whoſe logarithms were had before, by the addition or ſubtraction of their logarithms. Moreover, by the difference of their logarithms, and by their ſecond and third differences, if neceſſary, the void places may be ſupplied more expeditiouſly; the rule afore-going being to be applied only where the continuation of ſome full places is wanted, in order to obtain theſe differences.

By the ſame method rules may be found for the intercalation of logarithms, when of three numbers the logarithm of the leſſer and of the middle number are given, or of the middle number and the greater; and this although the numbers ſhould not be in arithmetical progreſſion. Alſo by purſuing the ſteps of this method, rules may be eaſily diſcovered for the conſtruction of artificial ſines and tangents, without the help of the natural tables. Thus far the great Newton, who ſays, in one of his letters to Mr. Leibnitz, that he was ſo much delighted with the conſtruction of logarithms, at his firſt ſetting out in thoſe ſtudies, that he was aſhamed to tell to how many places of figures he had carried them at that time: and this was before the year 1666; becauſe, he ſays, the plague made him lay aſide thoſe ſtudies, and think of other things.

Dr. Keil, in his Treatiſe of Logarithms, at the end of his Commandine's Euclid, gives a ſeries, by means of which may be found eaſily and expeditiouſly the logarithms of large numbers. Thus, let z be an odd number, whoſe logarithm is ſought: then ſhall the numbers $z-1$ and $z+1$ be even, and accordingly their logarithms, and the difference of the logarithms will be had, which let be called y. Therefore, alſo the logarithm of a number, which is a geometrical mean between $z-1$ and $z+1$, will be given, *viz.* equal to half the ſum of the logarithms.

Now the ſeries $y\times\frac{1}{4z}+\frac{1}{24z^3}+\frac{181}{15120z^7}+\frac{13}{25200z^9}$, &c. ſhall be equal to the logarithm of the ratio, which the geometrical mean between the numbers $z-1$ and $z+1$, has to the arithmetical mean, *viz.* to the number z. If the number exceeds 1000, the firſt term of the ſeries, *viz.* $\frac{y}{4z}$, is ſufficient for producing the logarithm to 13 or 14 places of figures, and the ſecond term will give the logarithm to 20 places of figures. But if z be greater than 10000, the firſt term will exhibit the logarithm to 18 places of figures: and ſo this ſeries is of great uſe in filling up the chiliads omitted by Mr. Briggs. For example, it is required to find the logarithm of 20001: the logarithm of 20000 is the ſame as the logarithm of 2, with the index 4 prefixed to it; and the difference of the logarithms of 20000 and 20001, is the ſame as the difference of the logarithms of the numbers 10000 and 10001, *viz.* 0.0000434272, &c. And if this difference be divided by $4z$, or 80004, the quotient $\frac{y}{4z}$ ſhall be

0.00000000005428 13; and if the logarithm of the geometrical mean, *viz.* 4.30105 17093 02416 be added to the quotient, the ſum will be

4.30105 17098 45230 = the logarithm of 20001.

Wherefore it is manifeſt that to have the logarithm to 14 places of figures, there is no neceſſity of continuing out the quotient beyond 6 places of figures. But if you have a mind to have the logarithm to 10 places of figures only, the two firſt figures are enough. And if the logarithms of the numbers above 20000 are to be found by this way, the labour of doing them will moſtly conſiſt in ſetting down the numbers. This ſeries is eaſily deduced from the conſideration of the hyperbolic ſpaces aforeſaid. The firſt figure of every logarithm towards the left hand, which is ſeparated from the reſt by a point, is called the index of that logarithm; becauſe it points out the higheſt or remoteſt place of that number from the place of unity in the infinite ſcale of proportionals towards the left hand: thus, if the index of the logarithm be 1, it ſhews that its hi[illegible]eſt place towards the left hand is the [illegible]place from unity; and therefore all [illegible]thms which have 1 for their index, [illegible]e found between the tenth and hundredth place, in the order of numbers. And for the ſame reaſon all logarithms which have 2 for their index, will be found between the hundredth and thouſandth place, in the order of numbers, *&c.* Whence univerſally the index or characteriſtic of any logarithm is always leſs by one than the number of figures in whole numbers, which anſwer to the given logarithm; and, in decimals, the index is negative.

As all ſyſtems of logarithms whatever, are compoſed of ſimilar quantities, it will be eaſy to form, from any ſyſtem of logarithms, another ſyſtem in any given ratio; and conſequently to reduce one table of logarithms into another of any given form. For as any one logarithm in the given form, is to its correſpondent logarithm in another form; ſo is any other logarithm in the given form, to its correſpondent logarithm in the required form; and hence we may reduce the logarithms of lord Naper into the form of Briggs's, and contrariwiſe. For as 2.302585092, *&c.* lord Naper's logarithm of 10, is to 1.0000000000, Mr. Briggs's logarithm of 10; ſo is any other logarithm in lord Naper's form, to the correſpondent tabular logarithm in Mr. Briggs's form; and becauſe the two firſt numbers conſtantly remain the ſame; if lord Naper's logarithm of any one number be divided by 2.302585, *&c.* or multiplied by 4342944, *&c.* the ratio of 1.0000, *&c.* to 2.30258 *&c.* as is found by dividing 1.00000, *&c.* by 2.30258 *&c.* the quotient in the former, and the product in the latter, will give the correſpondent logarithm in Briggs's form, and the contrary. And, after the ſame manner, the ratio of natural logarithms to that of Briggs's, will be found = 868588963806.

The uſe and application of LOGARITHMS. It is evident, from what has been ſaid of the conſtruction of logarithms, that addition of logarithms muſt be the ſame thing as multiplication in common arithmetic; and ſubtraction in logarithms the ſame as diviſion: therefore, in multiplication by logarithms, add the logarithms of the multiplicand and multiplier together, their ſum is the logarithm of the product.

		num.	logarithms
Example.	Multiplicand	8.5	0.9294189
	Multiplier	10	1.0000000
	Product	85	1.9294189

And in diviſion, ſubtract the logarithm of the diviſor from the logarithm of the dividend, the remainder is the logarithm of the quotient.

		num.	logarithms
Example.	Dividend	9712.8	3.9873444
	Diviſor	456	2.6589648
	Quotient	21.3	1.3283796

To find the complement of a LOGARITHM. Begin at the left hand, and write down what each figure wants of 9, only what the laſt ſignificant figure wants of 10; ſo the complement of the logarithm of 456, *viz.* 2.6589648, is 7.3410352.

In the rule of three. Add the logarithms of the ſecond and third terms together, and from the ſum ſubtract the logarithm of the firſt, the remainder is the logarithm of the fourth. Or, inſtead of ſubtracting a logarithm, add its complement, and the reſult will be the ſame.

To raiſe powers by LOGARITHMS. Multiply the logarithm of the number given, by the index of the power required, the product will be the logarithm of the power ſought.

Example. Let the cube of 32 be required

ed by logarithms. The logarithm of 32 = 1.5051500, which multiplied by 3, is 4.5154500, the logarithm of 32768, the cube of 32. But in raiſing powers, *viz.* ſquaring, cubing, *&c.* of any decimal fraction by logarithms, it muſt be obſerved, that the firſt ſignificant figure of the power be put ſo many places below the place of units, as the index of its logarithm wants of 10, 100, *&c.* multiplied by the index of the power.

To extract the roots of powers by LOGARITHMS. Divide the logarithm of the number by the index of the power, the quotient is the logarithm of the root ſought.

To find mean proportionals between any two numbers. Subtract the logarithm of the leaſt term from the logarithm of the greateſt, and divide the remainder by a number more by one than the number of means deſired; then add the quotient to the logarithm of the leaſt term (or ſubtract it from the logarithm of the greateſt) continually, and it will give the logarithms of all the mean proportionals required.

Example. Let three mean proportionals be ſought, between 106 and 100.

Logarithm of 106 = 2.0253059
Logarithm of 100 = 2.0000000

Divide by 4)0.0253059(0.0063264.75

Logarithm of the leaſt term 100 added		2.0000000
Logarithm of the firſt mean	101.4673846	2.0063264.75
Logarithm of the ſecond mean	102.9563014	2.0126529.5
Logarithm of the third mean	104.4670483	2.0189794.25
Logarithm of the greateſt term	106	2.0253059.

LOGIC, λογικη, the art of thinking and reaſoning juſtly; or, it may be defined the ſcience or hiſtory of the human mind, inaſmuch as it traces the progreſs of our knowledge from our firſt and moſt ſimple through all their different combinations, conceptions, and all thoſe numerous deductions that reſult from variouſly comparing them one with another. See the articles IDEA and KNOWLEDGE.

The preciſe buſineſs of logic, therefore, is to explain the nature of the human mind, and the proper manner of conducting its ſeveral powers, in order to the attainment of truth and knowledge. It lays open thoſe errors and miſtakes we are apt, through inattention, to run into; and teaches us how to diſtinguiſh between truth, and what only carries the appearance of it. By this means we grow acquainted with the nature and force of the underſtanding; ſee what things lie within its reach; where we may attain certainty and demonſtration; and when we muſt be contented with probability.

Theſe conſiderations ſufficiently evince the uſefulneſs of this ſcience, which is divided into four parts, according to the number of the operations of the mind in its ſearch after knowledge, *viz.* perception, judgment, reaſoning, and method. See the articles PERCEPTION, *&c.*

This valuable art of ranging our ideas, connecting them cloſely together, and conſequently of facilitating the tranſition from one to another, ſupplies us with a means of rendering all mens abilities nearly equal. In fact, all our knowledge is reducible to primitive ſenſations, which is nearly alike in all men. The art of combining and connecting our direct ideas only gives them a more or leſs exact arrangement and denomination; whence they become more or leſs ſenſible to others. A man who readily combines his ideas, differs but little from him who combines them ſlowly; as he who judges of a picture at ſight, differs but little from him who requires to be made ſenſible of all its parts: both at the firſt glance have the ſame ſenſations, though they ſink not ſo deep in the ſecond, who therefore dwells longer upon each, to render them ſtrong and diſtinct; and by this means, the reflex ideas of the firſt obſerver become as eaſy to the ſecond as direct ones And hence, perhaps, there is ſcarce an art or ſcience that may not, by means of a well adapted logic, be taught to a ſlow underſtanding; becauſe there are few arts or ſciences, whoſe precepts or rules may not be reduced to ſimple notions, and diſpoſed in ſo connected an order, that the chain need never be broken. As the mind is more or leſs ſlow in its operations, it requires more or leſs of this connected order. The advantage of a genius is that of having leſs occaſion for it; or rather, of being able to form it quick and almoſt imperceptibly. See the article DEMONSTRATION.

LOGISTIC CURVE, the ſame with that otherwiſe called logarithmic. See the article LOGARITHMIC.

LOGISTIC SPIRAL. See the articles LOGARITHMIC and SPIRAL.

LOGISTICA NUMERALIS, the fame with algorithm. See ALGORITHM.

LOGISTICAL ARITHMETIC, the doctrine of fexagefimal fractions. See the article SEXAGESIMALS.

LOGOGRIPH, λογογριφος, a kind of riddle, which confifts in fome allufion, or mutilation of words; and is of a middle nature between an ænigma and rebus. See the articles ÆNIGMA and REBUS.

Some alfo give the appellation logogriphs to canting arms. See the article ARMS.

LOHOCH, or LOCH, in pharmacy, a compofition of a middle confiftence between a foft electuary and a fyrup, principally ufed in diforders of the lungs.

There are feveral kinds of lohochs, denominated from the principal ingredient that enters into their compofition. 1. The common lohoch is made thus: take of frefh-drawn oil of fweet almonds, and of pectoral or balfamic fyrup, one ounce; white-fugar, two drams: mix, and make them into a lohoch. 2. Lohoch of gum tragacanth is made thus: take of the powder of gum tragacanth, two drams; japan-earth, one dram; whites of eggs beat into a fluid, one ounce; fyrup of meconium, two ounces: mix, as before. 3. Lohoch of linfeed oil is made thus: take of frefh-drawn linfeed-oil, and balfamic fyrup, each one ounce; flowers of fulphur, and white-fugar, each two drams: mix them. 4. Lohoch of manna, thus made: take of calabrian-manna, frefh-drawn oil of fweet-almonds, and fyrup of violets, each equal quantities: mix them. 5. Lohoch of fperma ceti, is made thus: take two drams of fperma ceti, rub it together with as much yolk of eggs, as will fit it to mix with half an ounce of frefh-drawn oil of almonds, and one ounce of balfamic fyrup, into the confiftence of a lohoch.

LOINS, *lumbi*, in anatomy, the two lateral parts of the umbilical region of the abdomen. See the article ABDOMEN.

LOIRE, the largeft river in France, rifes in the mountains of the Cevennes, and, after running a courfe of about five hundred miles, falls into the bay of Bifcay.

LOLIUM, DARNEL, in botany, a genus of the triandria digynia clafs of plants, the corolla whereof confifts of two valves, the lower is narrow, lanceolated, convoluted, acuminated, and of the length of the cup; the other is fhort, linear, obtufe, and hollowed upwards; there is no pericarpium, the corolla inclofes the feed, which is fingle, oblong, compreffed, convex on one fide, and plane and fulcated in the middle on the other.

The feed of this plant is reckoned attenuant, abftergent, drying and heating.

LOMBARDY, a kingdom which comprehended almoft all Italy. It was erected by the Longobards, or Lombards, a german nation, about the year 598, and lafted till Charlemain put an end to it, about the year 760.

LOMMOND, a lake in the county of Lenox, in Scotland, which runs almoft the whole length of the county.

LOMWIA, in zoology, the name of a web-footed water-fowl, common on the englifh fhores, about the fize of a common duck.

LONCHITIS, SPLEENWORT, in botany, a genus of the cryptogamia-filicum clafs of plants, the fructifications of which are arranged into lunulated feries, and difpofed feparately under the finufes of the leaves.

The leaves of this plant are of ufe in healing wounds, and in preventing inflammations of them; they are alfo ufed againft the fpleen; the root is aperient and diuretic.

LONDON, the metropolis of Great Britain, where the firft meridian is fixed on the britifh maps, lies in 51° 32′ north lat. on the river Thames, and the greateft part on the north fide of that river. The form of London, including Weftminfter and Southwark, comes pretty near an oblong fquare, five miles in length, if meafured, in a direct line from Hyde-Park to the end of Limehoufe, and fix miles, if we follow the windings of the ftreets; the greateft breadth is two miles and a half, and the circumference of the whole fixteen or feventeen miles, but it is not eafy to meafure it exactly, on account of its irregular form. The principal ftreets are generally level, exceeding well built, and extended to a very great length; thefe are inhabited by tradefmen, whofe houfes and fhops make a much better figure than thofe of any tradefmen in Europe. People of diftinction ufually refide in elegant fquares, of which there are great numbers at the weft end of the town near the court. What moftly contributes to the riches and glory of this city, is the port, whither feveral thoufand fhips of burden annually refort from all countries, and where the greateft fleets never fail to meet with wealthy merchants

merchants ready to take off the richeſt cargoes. The number of perſons in the whole place are computed to be about eight hundred thouſand.

LONDONDERRY, a city of Ireland, in the province of Ulſter, and county of Londonderry, ſituated on the river Mourn, near its mouth, in weſt long. 7° 40′, north lat. 54° 52′.

LONG, an epithet given to whatever exceeds the uſual ſtandard of length: thus, we ſay, a long-boat, long accent, *&c.*

LONGÆVITY, length of life. See AGE. Lord Bacon obſerves, that the ſucceſſion of ages, and of the generation of men, ſeems no way to ſhorten the length of human life, ſince the age of man, down from Moſes's time to the preſent, has ſtood at about eighty years, without gradually declining, as one might have expected; but doubtleſs there are times wherein men live to a longer or ſhorter age, in every country; and they generally prove longeſt-lived, whoſe times afford but a ſimple diet, and give greater occaſion to bodily exerciſe; and ſhorteſt lived, whoſe times are more polite, or abound in luxury and eaſe; but theſe things have their changes and revolutions, whilſt the ſucceſſion of mankind holds one uninterrupted in its courſe: and no queſtion but the ſame is the caſe in other animals, as neither oxen, horſes, ſheep, *&c.* have had their term of life ſhortened in the latter ages, and therefore the lives of creatures were at once abridged by the deluge, and the like may happen from other grand accidents, as particular inundations, long continued droughts, earthquakes, *&c.* The ſame author obſerves, that the inhabitants of cold, northern countries are generally longer lived than thoſe of the ſouthern regions; that high ſituations are more conducive to long life than low ones; and that the particular countries remarkable for long-lived inhabitants are, Arcadia, Ætolia, hither India, Braſil, Ceylon, Britain, Ireland, the Orkneys, and the weſtern Iſlands. The greateſt inſtances of longævity in theſe our iſlands, are that of old Parr, who lived almoſt 153 years; of Jenkins, of Yorkſhire, who lived 169 years; or of the counteſs Deſmond, or Mr. Eckleſton, both of Ireland, who each exceeded 140 years.

LONGFORD, a county of Ireland, in the province of Leinſter, bounded by the county of Letrim and Cavan on the north, by Meath on the eaſt and ſouth, and by Roſcommon on the weſt.

LONG-ISLAND, an iſland belonging to New-York in North America, lying between 71° and 74° weſt long. and in 41° 30′ north lat.

It is ſeparated by a narrow channel from the continent of New-York and Connecticut, and contains three counties, *viz.* Queen's County, Suffolk County, and Richmond County.

LONGIMETRY, the art of meaſuring lengths, both acceſſible, as roads, *&c.* and inacceſſible, as arms of the ſea, *&c.* See MEASURING, DISTANCE, CHAIN, THEODOLITE, CIRCUMFERENTOR, *&c.*

LONGINICO, a town of the Morea, in Europe, ſituated on the river Alpheus, fifty miles ſouth of Lepanto; being the antient Olympia, where Hercules inſtituted the Olympic games. See the article OLYMPIC GAMES.

LONGISSIMUS DORSI, in anatomy, a very complex, long and narrow muſcle, ſituated between the ſpinal apophyſes and the ſacro-lumbaris, from which it is divided by a fatty or cellular line; but, at the lower part, they are confounded together. It covers the ſemiſpinalis or tranſverſo-ſpinalis dorſi, and ſemi-ſpinalis lumborum. Its upper part lies between the ſacro-lumbaris and tranſverſalis colli. This muſcle, and the ſacrolumbaris are common to the back and loins. The longiſſimus dorſi is an aſſiſtant to the ſacro-lumbaris, eſpecially to its vertebral portion, which it helps very powerfully both by the multiplicity and inſertions of its fibres, in ſuſtaining the vertebræ of the back and loins, while extended, whether in ſitting or ſtanding, and in preventing their ſinking under the weight of the body, or any additional burden. It aſſiſts in performing, or counterbalancing all the motions and inflections which theſe vertebræ, eſpecially thoſe of the loins, are capable of in all poſtures of the body. And in this, it alſo bears ſome reſemblance to the inferior or vertebral portion of the ſplenius. And theſe two muſcles on each ſide, and the ſacro lumbares, are of the number of thoſe called vertebrales obliqui divergentes.

LONGISSIMUS OCULI. See OBLIQUUS.

LONGITUDE *of a ſtar*, in aſtronomy, an arch of the ecliptic, intercepted between the beginning of aries, and the point of the ecliptic cut by the ſtar's circle of longitude. See the article CIRCLE, *&c.*

LONGITUDE *of a place*, in geography, is an arch of the equator intercepted between the firſt meridian, and the meridian paſſing through the propoſed place; which

is always equal to the angle at the pole, formed by the firft meridian, and the meridian of the place.

The firft meridian may be placed at pleafure, paffing through any place, as London, Paris, Teneriff, &c. but among us, is generally fixed at London: and the longitudes counted from it will be either eaft or weft, according as they lie on the eaft or weft fide of that meridian.

The difference of longitude between two places upon the earth is an arch of the equator comprehended between the two meridians of thefe places; and the greateft poffible is 180°, when the two places lie on oppofite meridians.

Since the parallels of latitude always decreafe, the nearer they approach the pole; it is plain, a degree upon any of them muft be lefs than a degree upon the equator, in the ratio of the co-fine of the latitude to the radius. Hence, as the radius is to the co-fine of any latitude; fo is the minutes of difference of longitude between two meridians, or their difference in miles upon the equator, to the diftance of thefe two meridians on the parallel of that latitude, in miles. And, by this theorem, is the following table conftructed.

A Table, fhewing how many miles anfwer to a degree of longitude, at every degree of latitude.

D.L.	Miles	D.L.	Miles	D.L.	Miles	D.L.	Miles
1	59.99	24	54.81	47	40.92	69	21.50
2	59.97	25	54.38	48	40.15	70	20.52
3	59.92	26	53.93	49	39.36	71	19.54
4	59.86	27	53.46	50	38.57	72	18.55
5	59.77	28	52.97	51	37.76	73	17.54
6	59.67	29	52.47	52	36.94	74	16.53
7	59.56	30	51.96	53	36.11	75	15.52
8	59.42	31	51.43	54	35.27	76	14.51
9	59.26	32	50.88	55	34.41	77	13.50
10	59.08	33	50.32	56	33.55	78	12.48
11	58.89	34	49.74	57	32.68	79	11.45
12	58.68	35	49.15	58	31.79	8c	10.42
13	58.46	36	48.54	59	30.90	81	9.38
14	58.22	37	47.92	60	30.00	82	8.35
15	57.95	38	47.28	61	29.09	83	7.32
16	57.67	39	46.62	62	28.17	84	6.28
17	57.37	40	45.95	63	27.24	85	5.23
18	57.06	41	45.28	64	26.30	86	4.18
19	56.73	42	44.59	65	25.36	87	3.14
20	56.38	43	43.88	66	24.41	88	2.09
21	56.01	44	43.16	67	23.44	89	1.05
22	55.63	45	42.43	68	22.48	90	0.00
23	55.23	46	41.68				

LONGITUDE, in navigation, the diftance of a fhip or place, eaft or weft, from another, reckoned in degrees of the equator.

As the difcovery of a method to find the longitude would render voyages fafe and expeditious, and alfo preferve fhips and the lives of men, the following rewards have been offered by act of parliament, as an encouragement to any perfon who fhall difcover a proper method for finding it out: the author or authors of any fuch method, fhall be entitled to the fum of 10,000 l. if it determines the longitude to one degree of a great circle; to 15,000 l. if it determines the fame to two-thirds of that diftance; and to 20,000 l. if it determines the fame to one-half of the fame diftance; and that half of the reward fhall be due and paid when the commiffioners of the navy, or the major part of them, agree that any fuch method extends to the fecurity of fhips within eighty geographical miles of the fhores, which are places of the greateft danger; and the other half, when a fhip, by the appointment of the faid commiffioners, or the major part of them, fhall thereby actually fail over the ocean, from Great Britain to any fuch port in the Weft-Indies, as thofe commiffioners, or the major part of them, fhall choofe for the experiment, without lofing their longitude beyond the limits before-mentioned.

The French, Dutch, Spaniards, and other nations, have likewife offered rewards for the fame purpofe.

Since by the motion of the earth round its axis, every point upon its furface defcribes the circumference of a circle, or 360°, in twenty-four hours time, it is plain it muft defcribe 15° in one hour, becaufe $\frac{360}{24} = 15$. Hence the difference of longitude may be converted into time, by allowing one hour for every fifteen degrees, and proportionally for minutes: alfo difference of time may be converted into difference of longitude, by allowing fifteen degrees for every hour, and proportionally for a greater or lefs time. Confequently by knowing the one, we can eafily find the other.

Whatever contrivance, therefore, fhews the hours of the day, at the fame abfolute point of time, in two different places, likewife ferves to find the difference of longitude between thofe places. Now fince an eclipfe of the moon proceeds from nothing elfe but an interpofition of the earth between her and the fun, by which means fhe is prevented

from

from reflecting the light she would otherwise receive from the sun, the moment that any part of her body begins to be deprived of the solar rays, it is visible to all those people who can see her at the same time; whence if two or more different people, at two or more different places, observe the times when it first began or ended, or note the time when any number of digits was eclipsed, or when the shadow begins to cover or quit any remarkable spot, the difference of those times (if there be any) when compared together, will give the difference of longitude between the places of observation.

The longitudes of places may also be determined from the observations of solar eclipses, but these being incumbered with the considerations of parallaxes, are not near so proper as those of the moon are; and each of these happening but rarely, another excellent expedient has been thought of, and that is the eclipses of jupiter's satellites. See JUPITER.

Now as neither jupiter nor any of his attendants have any native light of their own, but shine with a borrowed light from the sun, it happens that each of these, in every revolution about jupiter, suffers two eclipses, one at their entrance into the shadow, the other at the entrance of their passage behind his body; whence in each revolution of the satellite there are four remarkable appearances, by the observation of any one of which the business may be done, *viz.* one at the entrance into the shadow, and one at the emersion out of it; one at the entrance behind the body, and another at the coming out; but the latter of these, *viz.* the ingress and egress of the satellite, into and from under the body, is not so much regarded by astronomers as the immersion into and out of the shadow, because, in the former, the difficulty of pronouncing the exact time is very great, it requiring, in each observer, eyes equally good and strong, and tellescopes equally large; but the observation of the former of these, *viz.* the immersion into, and emersion out of the shadow, is easy and practicable, because the quick motions of the sattellites plunge them so quick into the shadow of jupiter, that it is no difficult matter to pronounce, by any telescope by which they may be seen, the exact time of their immersion and emersion, as any one may soon be satisfied, if he will but try the experiment.

Now, inasmuch as each of these happens at the same moment of absolute time, if two or more persons, in different places, note the time of observation, these, when compared together, will give the difference of longitude between the two places of observation. And, when we consider the great number of these eclipses that happen every year, there being more visible in one year than there are days in it, and, consequently, but few nights when jupiter may be seen, (and which is near eleven months of the year) but that an eclipse of one or other happens, and sometimes two or three in a night; the easiness with which they may be made, there requiring only a telescope of eight or ten feet in length, which may be almost managed with the hand; and the little likelihood there is of missing the times of ingress or egress, they being in a manner momentaneous; and lastly, the great exactness to which they would give the difference of longitude, it being certainly as exact as the latitude can at present be taken; it is much to be wondered at, that the more skilful part of our seamen have so long neglected them, and especially in the several ports into which they sail.

Besides these, there is another method equally useful, expeditious, and certain; and that is, the appulses of the moon to certain fixed stars, and their occultations by the interposition of her body; for, the moon finishing her revolution in the space of twenty-seven days, seven hours, forty-three minutes, there are but few clear nights, when the moon does not pass over or so near to some fixed star, that her distance from it, or the time of her visible conjunction with it, may be easily observed by the telescope, and micrometer only; and these when compared together, or with the visible time computed to the meridian of some place when a good theory of the moon shall be obtained, will shew the difference of longitude of those places.

Mr. Flamstead has given us the places of near 1000 fixed stars, confirmed by several observations, that lie within the zodiac, each of which will be covered by the moon and the rest of the planets, in one revolution of their node; so that scarce one night can happen but some or other of them will be eclipsed, or approached so near unto, as to come within the compass of a telescope, in one place of the earth or other: add to these the eclipses of jupiter's satellites, and it is

scarce

ſcarce poſſible that any clear night can happen, but the heavens afford us ſome agreeable phænomenon or other, by which the longitude of any place may be duly aſcertained.

In the Philoſophical Tranſactions, nº 1, we have an account of a ſucceſsful experiment made with two pendulum-watches by major Holmes, in a voyage from the coaſt of Guinea homewards. This and ſome other ſucceſſes encouraged monſieur Huygens ſo far, that, after he had improved the ſtructure of theſe watches, he publiſhed an account at large for the ſhewing how and in what manner theſe watches are to be uſed in finding the longitude at ſea, with directions for adjuſting of them and keeping a journal by them; which account the curious reader may ſee at large in the Philoſophical Tranſactions, nº 47.

The chief objection againſt pendulum-clocks and watches, is the effects that heat and cold have upon the ſpring and pendulum, which makes the ſpring in watches draw ſtronger at ſome times than at other times, and cauſes the pendulum to lengthen and ſhorten, according as the weather is hotter or colder; but theſe effects are ſo regular, that without doubt they may be accounted for. See the article PENDULUM.

But the moſt ingenious and ſucceſsful machines for this purpoſe have been invented by Mr. John Harriſon, who, at different times, contrived three different time-pieces for determining the longitude at ſea.

The firſt of Mr. Harriſon's machines was tried in May, 1736, when it was put on board a man of war, and by its exact meaſure of time, in its return from Liſbon, corrected an error of almoſt a degree and an half in the computations of the reckoning of a ſhip. In 1739, Mr. Harriſon finiſhed his ſecond machine, which, from various experiments made upon it, was ſufficiently regular and exact, for finding the longitude of a ſhip within the neareſt limits propoſed by parliament. Upon the ſucceſs of this, Mr. Harriſon, in 1741, undertook a ſtill more advantageous machine, which he finiſhed in 1758, when he applied to the commiſſioners of longitude, for orders to make a trial of that inſtrument to ſome part in the Weſt Indies, as directed by the ſtatutes for the diſcovery of the longitude at ſea. In conſequence of this application, Mr. Harriſon received orders for his ſon to proceed from Portſmouth to Jamaica, in one of his majeſty's ſhips of war, with his third inſtrument, in November 1761; and the commiſſioners having directed that every requiſite ſtep and precaution ſhould be taken, for making, with care, the proper experiments, and aſcertaining their accuracy, not only going to Jamaica, but in the return, it appears, from the calculations made from the experiments in going to Jamaica, that the difference between the longitude, as found by the time-piece, and calculated by the obſervations of the tranſit of mercury in 1743, at Jamaica and London, is five ſeconds of time, which, at Jamaica is little more than a geographical mile.

During the voyage, Mr. Harriſon's time-piece corrected the ſhip's reckoning, which ſometimes erred about a degree and a half: and in going from Madeira to Jamaica, it alſo corrected the errors of the log, and ſhewed the longitude ſo exactly, that the ſhip made the iſland of Deſeada, and all the other iſlands, until they arrived at Jamaica, as foretold by the time-piece. At the arrival at Jamaica, the obſervations for finding the time were made by equal altitudes; and the longitude ſhewn by the time-piece, being within 5″ of time of the longitude ſhewn by the moſt accurate obſervations of mercury, in its tranſit over the ſun, in the year 1743, and with which all the obſervations at London and Paris, agreeing within 23″, amounts to a demonſtration, that Mr. Harriſon has performed all that is required by the ſtatute of the 12th of queen Anne, to entitle him to the greateſt reward mentioned in that act.

In returning from Jamaica, the weather was very tempeſtuous, ſo that the time-piece was forced to be placed on the counter, to avoid being perpetually expoſed to the ſea-water, there it ſuffered continual violent agitations, which, though they neceſſarily retarded its motion, yet did not occaſion any ſuch conſiderable error, as would have made Mr. Harriſon's right to the greateſt reward queſtionable, had it depended on this voyage only, for the time-keeper, in its going and return, loſt only 1′ 54″ and ½, which, in the latitude of Portſmouth, amounts to about eighteen geographical miles, or minutes of a great circle, whereas the act required only that it ſhould

ſhould come within the diſtance of thirty geographical miles or minutes of a great circle.

Some alſo propoſe a method of finding the longitude, by means of a dipping needle. See the article NEEDLE.

For the method of correcting the longitude found by the dead reckoning, ſee the article RECKONING.

Argument of LONGITUDE. See the article ARGUMENT.

LONGITUDE *of motion*, according to ſome philoſophers, is the diſtance which the center of any moving body runs through, as it moves on in a right line. See the article MOTION.

LONGITUDINAL, in general, denotes ſomething placed lengthwiſe: thus ſome of the fibres of the veſſels in the human body are placed longitudinally, others tranſverſely, or acroſs.

LONGUEVILLE, a town of Normandy, in France, twenty miles north of Rouen: eaſt long. 1° 10′, north lat. 49° 50′.

LONGUS, LONG, an epithet given by anatomiſts to ſeveral muſcles to diſtinguiſh them from others of the ſame name, which are called breves or ſhort; thus there is the longus cubiti, which ariſes from the inferior coſta of the ſcapula: the longus colli, which ariſes from the bodies of the five upper vertebræ of the back, and is inſerted into all the vertebræ of the neck; the longus radii, which has its origin from the exterior ſpine of the humerus, and its termination at the lower end of the radius. See the article MUSCLE.

LONGWY, a town in the dutchy of Lorrain, ten miles ſouth-weſt of Luxemburg: eaſt long. 5° 25′, north lat. 49° 38′.

LONICERA, HONEY-SUCKLE, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle petal, the tube is oblong and gibboſe downwards; the limb is divided into five ſegments, one of which is more deeply ſerrated than the reſt: the fruit is a roundiſh umbilicated berry, containing two cells; the ſeeds are roundiſh and compreſſed.

LONSDALE, a market-town of Weſtmoreland, 25 miles ſouth of Appleby.

LOO, a town of Guelderland in the United Provinces, eight miles weſt of Deventer.

LOO, or LANTER LOO, a game at cards. See the article LANTER-LOO.

LOOF, in the ſea-language, is a term uſed in various ſenſes; thus the loof of a ſhip is that part of her aloft, which lies juſt before the cheſt-tree; hence the guns which lie there are called loof-pieces: keep your loof, ſignifies, keep the ſhip near to the wind; to loof into a harbour, is to ſail into it cloſe by the wind: loof up, is to keep nearer the wind: to ſpring the loof, is when a ſhip that was going large before the wind, is brought cloſe by the wind.

LOOF-TACKLE, is a tackle in a ſhip which ſerves to lift goods or ſmall weight in or out of her.

LOOKING-GLASSES, are nothing but plane mirrours of glaſs; which being impervious to the light, reflect the images of things placed before them; for the theory whereof ſee the articles MIRROUR and REFLECTION.

For the caſting, grinding, and poliſhing of looking glaſſes, ſee the article GLASS.

For foliating of looking-glaſſes, ſee the article FOLIATING.

LOOM, a frame compoſed of a variety of parts, uſed in all the branches of weaving; for a particular deſcription of which, ſee the article WEAVING.

LOOM, in the ſea-language: when a ſhip appears big, when ſeen at a diſtance, they ſay ſhe looms.

LOOM-GALE, a gentle eaſy gale of wind, in which a ſhip can carry her top ſails a-trip.

LOON, in ornithology, the engliſh name of ſeveral ſpecies of the colymbus, or diver kind. See the article COLYMBUS.

LOOP, in the iron works, denotes a part of a ſow, or block of caſt iron, broken or melted off from the reſt.

LOOP-HOLES, in a ſhip, are holes made in the coamings of the hatches of a ſhip, and in their bulk-heads, to fire muſkets through, in a cloſe fight.

LOPHIUS, in zoology, a genus of the branchioſtegious order of fiſhes, whoſe head is in ſize equal to all the reſt of the body: the head and body are both of a depreſſed form: there are a number of fleſhy pinnules, or appendages ſurrounding the whole body of the fiſh.

Of this fiſh there is only one genus, commonly known by the name of rana piſcatrix. See the article RANA.

LOPPING, among gardeners, the cutting off the ſide-branches of trees.

It is obſervable, ſays Mr. Miller, that moſt old trees, as aſh, elm, hornbeam, &c. are hollow within, which does not proceed from the nature of the trees, but in their being ſuffered to grow large before they are lopped. The lopping of young

young trees of ten or twelve years old, at most, will preserve them much longer, and will occasion the shoots to grow more into wood in one year, than they do in old tops at two or three. Great boughs ill taken off, are very prejudicial to trees, for which reason they should always be taken off close and smooth, and not parallel to the horizon; and the wound should be covered with a mixture of loam and horse-dung, to prevent the wet from entering the body of the tree: however, no trees should be lopped but pollard-trees, for nothing is more injurious to the growth of timber-trees, than lopping off great branches from them. All sorts of resinous trees, or such as abound with a milky juice, should be lopped sparingly; for they are subject to decay when often cut. The best season for lopping these trees is soon after Bartholomew-tide; at which time they seldom bleed much, and the wound is commonly healed over before the cold weather comes on.

LOQUABYR, or LOCHABAR, a part of the county of Inverness, in Scotland, so called. See the article INVERNESS.

LORA, the name of two towns in Spain, one in the province of Granada, and the other in Andalusia.

LORA, also the name of a town of Germany, in the circle of Upper Saxony, thirty miles north of Saxe-Gotha.

LORANTHUS, in botany, a genus of the hexandria-monogynia class of plants; the corolla whereof is formed of a single petal of a sexangular figure, and divided into six nearly equal, linear, revolute segments; the fruit is a roundish unilocular berry; the seeds are six, convex on one side and angular on the other.

LORCA, a town of Spain, in the province of Murcia, thirty-five miles west of Carthagena.

LORD, a title of honour, given to those who are noble, either by birth or creation; in this sense it amounts to much the same as peer of the realm, or lord of Parliament. This title is, by the courtesy of England, also given to all the sons of dukes and marquises, and to the eldest sons of earls: and it is also a title of honour bestowed on those who are honourable by their employments, as lord advocate, lord chamberlain, lord chancellor, *&c.* See the articles *Lord* ADVOCATE, *Lord* CHAMBERLAIN, *Lord high* CHANCELLOR, *&c.*

Lord in law, is a title given to a person who has a fee, and consequently the homage of tenants within his manor. These lords are divided into lords mesne, and lords paramount. See the articles HOMAGE, MESNE, and PARAMOUNT.

LOREDO, a town of Italy, in the Polesine de Rovigo, and territory of Venice, situated on the river Adige, twenty miles east of Rovigo.

LORETTO, a city of Italy, in the marquisate of Ancona, in the pope's territories, 145 miles east of Rome. This place is famous for the chamber of the blessed Virgin, which, according to the roman catholic tradition, was brought by angels from Palestine to Dalmatia, and from thence transported over into Italy, and fixed at Loretto.

LORICATION, COATING, in chemistry, is the covering a glass or earthen vessel with a coat or crust of a matter able to resist the heat, to prevent its breaking in the performing an operation that requires great violence of fire.

When vessels are exposed naked to the greatest fire, it easily happens that they burst by throwing fresh cold fuel into the fire, for the preventing of which, the operator must have recourse to lorication, or coating. This is performed in the following manner: take some of the same matter of which the muffles and crucibles are made, and instead of water moisten it with fresh blood not yet coagulated, and diluted with twice or thrice the same quantity of water, to make a thin paste of it, then add to this paste cow's hairs, or other hairs, not very long nor stiff, and if you have at hand glass pulverized and sifted, it may also be of service to mix some of it with the rest, then with this mass besmear your vessel with a pencil, and dry it; when dried, besmear it a second time, and dry it again; repeat this a third and fourth time, till the vessel be covered over with a crust or coat, one third or fourth part of an inch. See the article CRUCIBLE.

LORN, the north part of Argyleshire in Scotland, bounded by Lochabar on the north; by Broadalbin on the east; by the rest of Argyleshire on the south; and by the sea on the west.

LORRAIN, a dutchy formerly belonging to the circle of the Upper Rhine in Germany, but now united to the crown of France. It is bounded by the dutchy of Luxemburg on the north; by Alsatia, the dutchy of Deux Ponts, and the Palatinate

latinate of the Rhine, on the eaſt; by the county of Burgundy, on the ſouth; and by Champaign, on the weſt.

LOT, *ſors*, a portion, ſhare, or part of a thing, parcel of goods, or cargo, divided into many; alſo the condition, chance, or fortune of a perſon. See the article SORTILEGE.

LOT and SCOT. See the article SCOT.

LOT, or LOTH, in mining, the thirteenth diſh, meaſure, or part of the miner's ore, which the bar maſter takes up for the king, or the farmer.

LOTHIAN, a county of Scotland, bounded by the firth of Forth on the north; by the German Sea, on the eaſt; by Clydeſdale, Tweedale and Merſe, on the ſouth; and by Stirling, on the weſt. The capital of this county is Edinburgh.

LOTION, *lotio*, in medicine and pharmacy, is, ſtrictly ſpeaking, ſuch waſhing as concerns beautifying the ſkin, by cleanſing it of thoſe deformities which a diſtempered blood ſometimes throws upon it, or rather are made by a preternatural ſecretion: for according to Quincy, generally thoſe diſtempers of the ſkin commonly accounted ſigns of a foul blood, are from thoſe ſalts which are natural in the beſt conſtitution, thrown off by the cutaneous glands, which ought to be waſhed away through the kidneys; ſo that inſtead of thoſe inſignificant and rediculous tribes of ſweetners, which in this caſe are frequently uſed, promoting the urinary diſcharge, or rectifying that of the ſkin by proper waſhes, frictions, or ointments, or both together, is the only way to get rid of ſuch diſorders: under this diviſion we ſhall therefore give ſuch examples of what is proper for this purpoſe, though many mix herewith ſuch as are more ſuitable for fomentation. See the article FOMENTATION.

To make a repelling lotion: take litharge of gold, four ounces; white wine vinegar, half a pound; digeſt them together three days, ſtirring it often, and then filtre for uſe. This is proper in tetterous eruptions and pimples, which with heat are apt to break out upon the ſkin; but it is not to be uſed in critical breakings out, which are by no means to be drove back, but rather encouraged. See the article ERUPTION.

To make a ſtronger repelling lotion: take common white vitriol, an ounce; crude alum, two drams; boil them in twelve ounces of ſpring-water to eight ounces; take off the ſcum, and put the liquor up for uſe. This muſt be boiled in an iron veſſel, becauſe it is ſo penetrating as to run through any other. It may be diluted with roſe-water, ſo as to make a good collyrium. The uſe of this is yet more miſchievous than the former, if due care be not taken: therefore ſome other emunctory muſt be in readineſs to diſcharge what is leſſened by the application of this medicine.

To make an oily lotion for ſmoothing and ſoftening the ſkin, and deterging or repelling the humours which deform it, but chiefly to cleanſe away freckles and morphew: take oil of tartar per deliquium, an ounce; oil of ſweet almonds, two drams; roſe-water, four ounces, ſhake them together.

LOTTERY, a kind of public game at hazard, frequent in Britain, France, and Holland, in order to raiſe money for the ſervice of the ſtate; being appointed with us by the authority of parliament, and managed by commiſſioners appointed by the lords of the treaſury for that purpoſe. It conſiſts of ſeveral numbers of blanks and prizes, which are drawn out of wheels, one of which contains the numbers, and the other the correſponding blanks or prizes. In order to ſuppreſs private lotteries, it is ordained that no perſon ſhall put up any office for the ſale of any houſe, lands, or goods, *&c.* or expoſe the ſame to ſale by way of lottery, lots, tickets, or numbers, nor ſhall they publiſh any propoſal relating thereto under the penalty of 500 l. and likewiſe the adventurers in ſuch ſales ſhall forfeit double the ſum they had contributed. Any perſon who ſhall ſell or deliver any ticket in any foreign lottery, ſhall upon conviction of that offence, forfeit 200 l. A yearly ſum of 24,000 l. out of the additional duties on ſtamped vellum, parchment, and paper, ſhall be a fund for annuities of three per cent. to contributers in a lottery until redemption by parliament, and ſhall be paid half yearly at Chriſtmas and Midſummer to the caſhier of the bank. See the articles CHANCE, GAMING, *&c.*

LOTUS, the SQUARE-PODDED VETCH, in botany, a genus of the diadelphia-decandria claſs of plants, the corolla whereof is papilionaceous, the vexillum is roundiſh, and bent back, with an oblong concave unguis; the alæ are roundiſh, and ſhorter than the vexillum; the carina is gibbous underneath, and ſhut above: the fruit is a cylindric pod, conſiſting

fifting of two valves, and containing two cells: the feeds are numerous and roundifh.

LOVAGE, in botany, the englifh name for the liguſticum. See LIGUSTICUM.

LOUDAN, a town of France, in the province of Orleanois, and territory of Poiĉtou, fituated twenty-five miles north of Poiĉtiers.

LOVE APPLE, the fruit of a fpecies of folanum, a plant cultivated in gardens among us for the fingularity of its appearance: the Portuguefe eat this fruit either raw or ftewed, as do alfo the jew-families in England.

LOVENDEGEN, a fortrefs in the Auftrian Netherlands, in the province of Flanders, fituated on the canal between Ghent and Bruges, five miles weft from Ghent.

LOUGHBOROUGH, a market-town in Leicefterfhire, fituated ten miles north of Leicefter.

LOUIS, or *Knights of St.* LOUIS, the name of a military order in France inftituted by Louis XIV. in 1693. Their collars are of a flame-colour, and pafs from left to right; the king is their grand mafter. There are in it eight great croffes, and twenty-four commanders; the number of knights is not limited. At the time of their inftitution, the king charged his revenue with a fund of three hundred thoufand livres for the penfions of the commanders and knights. See the croffes worn by thefe knights, reprefented in plate CLXII. fig. 5.

LOUIS, LEWIS, LOUIS D'OR, or LEWISDORE, a french coin. See COIN.

LOUISIANA, or NEW FRANCE, a country of north America, bounded with the river and lake of Illenois, on the north; North Carolina, on the eaft, and the gulph of Mexico on the fouth.

LOUITS, a town of Great Poland, in the palatinate of Rava, fixty-five miles eaft of Gnefna.

LOUREBRANDER, a town of hither India, at the mouth of the river Indus, in eaft long. 67°, north lat. 25°.

LOUSE, *pediculus*, in zoology. See the article PEDICULUS.

LOUTH, a county of Ireland, in the province of Leinfter, bounded by Monaghan and Armagh on the north; by the Irifh Channel, on the eaft; by Eaft Meath, on the fouth; and by Cavan, on the weft.

LOUTH, a market-town of Lincolnfhire, twenty-four miles north-eaft of Lincoln.

LOUVAIN, a city of the Auftrian Netherlands, in the province of Brabant, fituated on the river Dyle, fifteen miles north-eaft of Bruffels.

LOUVESTEIN, a fortrefs of the United Provinces, fituated in the province of Holland, at the confluence of the rivers Waal and Maes, fixteen miles eaft of Dort.

LOUVO, a city of Siam, in the farther India, fituated in eaft long. 101°, north lat. 15°.

LOW-BELLS, or LOW-BELLERS, in our ftatute-book, are perfons who go in the night-time with a light and a bell, by the fight and noife whereof birds, fitting on the ground, become ftupified, and fo are covered with a net and taken.

LOWERING, among diftillers, a term ufed to exprefs the debafing the ftrength of any fpirituous liquors, by mixing water with it. The ftandard and marketable price of thefe liquors is fixed in regard to a certain ftrength in them called proof; this is that ftrength which makes them when fhook in a vial, or poured from on high into a glafs, retain a froth or crown of bubbles for fome time. In this ftate, fpirits confift of about half pure or totally inflammable fpirit, and half water; and if any foreign or home fpirits are to be expofed to fale, and are found to have that proof wanting, fcarce any body will buy it till it has been diftilled again and brought to that ftrength; and if it is above that ftrength, the proprietor ufually adds water to it to bring it down to that ftandard. See the article PROOF.

There is another kind of lowering among the retailers of fpirituous liquors to the vulgar, by reducing it under the ftandard-proof: whoever has the art of doing this without deftroying the bubble proof, which is eafily done by means of fome addition that gives a greater tenacity to the parts of the fpirits, will deceive all that judge by this proof alone. In this cafe, the beft way to judge of liquors is by the eye and tongue, and efpecially by the inftrument called hydrometer. See the article HYDROMETER.

LOXA, a city of Peru, 200 miles eaft of Payta: weft long. 77°, fouth lat. 5°.

LOXIA, in the linnæan fyftem of zoology, the name of a genus of birds of the order of the pafferes; the diftinguifhing characters of which are, that the tongue is plain, equal and whole, the beak large, thick, and fhort, and crooked and convex both ways.

5 Of

Of this genus is the crofs-bill, called in fome places the fhell-apple, fuppofed to be the tragon of the antients. It is about the fize of the green-finch, and much of the fame fhape. It has a forked tail, and the chaps of its bill are fo bent, that the points crofs one another; whence the name. See plate CLXIV. fig. 1.

LOXODROMICS, the art of oblique failing. See the article SAILING.

LOYA, a town of Spain, in the province of Granada, twenty-five miles weft of the city of Granada.

LOZENGE, LOZANGE, *rhombus*, in geometry, a quadrilateral figure, confifting of four equal and parallel fides, two of whofe oppofite angles are acute, and the other two obtufe: the diftance between the two obtufe ones being always equal to the length of one fide; when the fides are unequal, the figure is called a rhomboides.

LOZENGE, in heraldry, a rhombus, or figure of equal fides, but unequal angles, refembling a quarry of glafs in our old windows, placed ereft, point-ways. It is in this figure, that all unmarried gentlewomen and widows bear their coats of arms, becaufe, as fome fay, it was the figure of the amazonian fhield; or as others, becaufe it is the antient figure of the fpindle. Plate CLXII. fig. 6. reprefents an ordinary of lozenges.

The lozenge differs from the fufil, in that the latter is narrower in the middle, and not fo fharp at the ends.

LOZENGE, in pharmacy, the fame with what is otherwife call troche. See the article TROCHE.

LUBAN, a town of Livonia, feventy miles eaft of Riga, fubject to Ruffia.

LUBEC, a city and port-town of Germany, in the circle of Lower Saxony, and dutchy of Holftein, fituated ten miles fouth-weft of the Baltic fea: eaft long. 10° 35′, north lat. 54′ 20′.

LUBEN, a town of Germany, in the circle of Upper Saxony, and marquifate of Lufatia: eaft longitude 14° 25′, north latitude 52°.

LUBEN, a town of Bohemia, in the province of Silefia, twenty-two miles north-weft of Breflaw.

LUBLIN, a city of Poland, in the palatinate of the fame name: eaft long. 22° 15′, north lat. 51° 30′.

LUBOW, a town of Poland, in the palatinate of Cracow; eaft long. 20° 30′, north lat. 49° 30′.

LUC, a town of Provence, in France, twenty-three miles north-eaft of Toulon.

LUC, is alfo a town of France, in the province of Dauphine, thirty-two miles fouth of Grenoble.

LUCAR, or *St.* LUCAR, a port-town of Spain, in the province of Andalufia: weft long. 6° 38′, north lat. 36° 42′.

St. LUCAR is alfo a town of Andalufia, in Spain: weft longitude 8° 12′, north latitude 37° 20′.

St. LUCAR is alfo the name of another town of Spain, fifteen miles weft of Seville.

LUCARNO, a town of the dutchy of Milan, fituated on the lake of Maggiore, but fubject to Switzerland.

LUCAYA, or BAHAMA-ISLANDS. See the article BAHAMA.

LUCCA, the capital of the republic of the fame name in Italy, fituated twelve miles eaft of the Tufcan fea: eaft longitude 11° 20′, north latitude 43° 45′.

The territory of this fmall republic is about twenty-five miles long, and twenty broad, and the ordinary revenues of the ftate about 30,000 l. *per annum.*

LUCERA, a town of Italy, in the kingdom of Naples, and territory of the Capitinate: eaft longitude 16° 6′, north latitude 41° 20′.

LUCERN, the capital of the canton of the fame name in Switzerland, fituated on the lake Lucern, to which it gives its name: eaft long. 8° 12′, north lat. 47°. It ftands on a plain almoft furrounded with mountains. The canton itfelf, which is inhabited by papifts, is about fifty miles long, and thirty broad.

LUCERNA, a town of Italy, in the territory of Piedmont, fifteen miles fouth of Turin.

LUCERNA, in ichthyology, a name given to a fifh more commonly known by that of uranofcopus. See URANOSCOPUS.

LUCERNE, in botany, &c. a plant frequently cultivated in the manner of clover, and known among authors by the names of medica and medicago. See the article MEDICAGO.

The leaves of this plant grow three at a joint, like thofe of clover; its ftalks are ereft, and after mowing, immediately fpring up again from the ftubble or cut ftumps. It is made into hay in the fame manner as faint-foin, but fhould be mowed before it flowers: it makes the fweeteft and moft fattening food in the world for cattle; but muft be given with caution, otherwife it will caufe them to fwell. See the article HAY.

LUCHEN, a town of Spain, in the province

of Valencia, thirty miles south of the city of Valencia.

LUCIA-ISLANDS, one of the Caribbee-islands in America, situated seventy miles north-west of Barbadoes, being twenty-two miles long, and eleven broad.

St. LUCIA, one of the Cape Verd islands in Africa, lying in west long. 25°, north lat. 16° 30′.

LUCID INTERVALS, in lunatics, the times wherein they appear to be in their senses. See the article LUNATIC.

LUCIDA, in astronomy, an appellation given to several fixed stars on account of their superior brightness; as the lucida coronæ, a star of the second magnitude, in the northern crown; the lucida hydræ, or cor hydræ; and the lucida lyræ, a star of the first magnitude, in that constellation.

LUCIGNANO, a town of Italy, in the dutchy of Tuscany, situated in east long. 12° 35′, north lat. 43° 10′.

LUCIOPERCA, the PIKE-PEARCH, or BRASSE, in ichthyology, a species of pearch, with two large teeth on each side. It grows frequently to two feet in length; its head is large, and compressed; its breast flat; and the belly convex, as is the back; and the fins are situated as represented in plate CLXIII. fig. 1.

LUCIUS, the PIKE, or JACK, in ichthyology, a species of esox, with a depressed rostrum. See the article ESOX.

The pike grows to a considerable size, but usually is found from fourteen inches to two feet in length: it is all over variegated with round yellowish spots. It is a well known and very voracious fish. See plate CLXIII. fig. 2.

For the method of fishing it, see the articles FISHING and HUXING.

LUCIUS MARINUS, the name of two fishes, otherwise called hake and sphyræna.

LUCON, a town of France, in the territory of Poictou, situated fifteen miles north of Rochelle.

LUCONIA, or MANILLA, the chief of the Philippine islands, situated between 117° and 123° east long. and between 12° and 19° of north lat.

LUDLOW, a borough of Shropshire, situated on the river Corve, eighteen miles south of Shrewsbury. It sends two members to parliament.

LUDUS HELMONTII, in natural history, a name given to the septariæ with sparry partitions. See SEPTARIÆ.

LUDWIGIA, in botany, a genus of the tetrandria-monogynia class of plants, the corolla whereof consists of four plane, patent, equal petals, of an obversely cordated figure: the fruit is a quadragonal obtuse capsule, surrounded with the cup, and coronated with it at the extremity: in consists of our cells, and opens in four places at once: the seeds are numerous and small.

LUES, among physicians, is, in general, used for a disease of any kind; but, in a more particular sense, is restrained to contagious and pestilential diseases: thus the lues gallica, or venerea, signifies the venereal disease. See the article POX, &c.

LUFF, or LOOF, in the sea language. See the article LOOF.

LUG, a river of Wales, which passes by Monmouth, and falls into the Severn at Chepstow.

LUGANO, a town of Italy, in the dutchy of Milan, situated on the lake Lugano, twenty miles north-west of Como.

LUGGERSHAL, a borough-town, ten miles north of Salisbury. It sends two members to parliament.

LUGO, a city and bishop's see of Spain, sixty miles east of Compostella: west long. 7° 50′, and north lat. 43° 5′.

LUKE, or *gospel of St.* LUKE, a canonical book of the New Testament.

Some think it was properly St. Paul's gospel, and that when that apostle speaks of his gospel, he means what is called St. Luke's. Irenæus says, that St. Luke digested into writing what St. Paul preached to the gentiles; and Gregory Nazianzen tells us, that St. Luke wrote with the assistance of St. Paul.

"St. Luke, says a modern writer, is "pure, copious, and flowing in his lan-"guage, and has a wonderful and en-"tertaining variety of select circum-"stances in his narration of our Savi-"our's divine actions. He acquaints us "with numerous passages of the evan-"gelical history, not related by any other "evangelist; both in his gospel and apo-"stolical acts, he is accurate and neat, "clear and flowing, with a natural and "easy grace: his stile is admirably ac-"commodated to the design of his hif-"tory; it had a good deal of resem-"blance to that of his great master St. "Paul; and like him, he had a learned "and liberal education. I believe he "had been very conversant with the best "classics; for many of his words and "expressions are exactly parallel to "theirs." *Blackwall's Sacred Classics.*

St.

St. Luke *the evangelist's day*, a festival in the christian church, observed on the 18th of October.

LULA, a town of swedish Lapland, situated at the mouth of the river of the same name, on the west side of the Bothnic gulph: east longitude 21°, north latitude 64° 30′.

Lula lapmark, a province of Sweden, bounded on the north by that of Torne; on the east, by the Bothnic gulph; on the south, by Pithia-lapmark; and on the west, by Norway.

LUMBAGO, in medicine, denotes a pain about the loins, as that preceding fevers, agues, and rheumatism. See the articles Fever, Ague, and Rheumatism.

LUMBARIS, a name given to the arteries and veins which spread over the loins; or an epithet to distinguish those branches of the aorta which carry the blood to the muscles of the loins, to those of the abdomen, and other of the circumjacent parts, and also to certain veins which bring back the blood from the loins into the trunk of the vena cava.

LUMBRICAL, a name given to four muscles of the fingers, and to as many of the toes. They are in each called the flexors of the first phalanx; those of the fingers arise deep and tendinous, and are inserted into the first phalanges on the side next the thumb: those of the toes have their origin from the tendon of the musculus perforans, and from the interior part of the calcaneum: their termination is at the first phalanx of the several toes.

LUMBRICUS, the earth-worm, in zoology. See the article Worms.

LUMME, in ornithology, a species of colymbus, with palmated undivided feet. See the article Colymbus.

This is a very beautiful bird, and is extremely common in some particular parts of the north of Europe, though wholly unknown elsewhere: it is about equal to our common wild-duck in size; the head is large, and rounded at the sides, but somewhat depressed on the crown; the eyes are large, sharp, and piercing, and their iris of a fine pale hazel; the beak is about an inch and three quarters in length, and towards the base pretty thick, and of a deep glossy black; as are also the legs, which are very robust; the head and neck are grey; the back and wings black, but beautifully variegated with square spots of white; and the breast and belly are white.

LUMP-FISH, *cyclopterus*. See the article Cyclopterus.

LUNA, in astronomy, the moon. See the article Moon.

Luna, among chemists, signifies silver. See the article Silver.

LUNAR, something belonging to the moon; thus we say lunar month, lunar year, lunar dial, lunar eclipse, *&c.* See Moon, Month, Year, *&c.*

LUNARIA, honesty, in botany, a genus of the tetradynamia-siliculosa class of plants; the corolla whereof consists of four cruciform, entire, obtuse, large petals of the length of the cup, and ending in ungues of the same length; the fruit consists of an elliptic, plano compressed, erect, and very large pod, standing upon a pedicle, terminated by a style, consisting of two valves, and containing two cells; the seeds are few, kidney shaped, compressed, marginated, and placed in the middle of the pod.

This plant is famous in some parts of the kingdom for its medicinal virtues, though it has not the fortune to be received in the shops. The people in the northern countries dry the whole plant in the oven, and give as much as will lie on a shilling for a dose, twice a day, in hæmorrhages of all kinds, particularly in the too abundant flowing of the menses, and this with great success. The Welsh, among whom it is not uncommon, Dr. Needham informs us, make an ointment of it, which they use externally, and pretend it cures dysenteries.

LUNATIC, a person affected with lunacy, the cure of which is to be attempted by evacuations of all kinds; as bleeding, vomiting, cathartics, *&c.* See Madness.

A lunatic is defined by our lawyers to be a person who is sometimes of a sound mind, and at other times not so; in which last case, he is said to be *non compos mentis*. A lunatic, while in this state, is not chargeable with any criminal act, except an attempt upon the person of the king; and, therefore, where a person incites a lunatic to commit a criminal action, he is, in the eye of the law, a principal offender, and is punished in the same manner as if he committed it himself. But tho' a lunatic is not punishable, yet to prevent mischief, he may be confined in prison till he has recovered his senses. Lunatics or madmen, that wander about, may be apprehended by a justice's warrant, locked up, and chained, if necessary; or sent to their legal settlement,

ment, and two justices of peace may charge their estates for their maintenance. Commissions of lunacy are issued out of chancery, impowering the commissioners to examine whether a person be a lunatic, and also to make inquest of his lands, &c. But in such case, tho' lands are seized by the king upon a commission of lunacy and he grants the custody of the lunatic, *sine computo reddendo*, that is, without an account to be rendered; yet if the lunatic becomes afterwards of a sound memory, he may have an action of account for the profits. It is ordained, that the king shall provide that the lands of a lunatic be safely kept, that he and his family be maintained out of the profits, and the residue delivered to him when he comes to his right mind, the king taking nothing to himself: any deed or contract made by a lunatic, may be set aside by his next heir, but not by himself; yet where a lunatic has purchased, if he recover his memory, he may agree to it, after which his heirs cannot disagree to it.

LUND, or LUNDEN, a city of Sweden, in the province of Gothland, the capital of the territory of Schonen, situated thirty miles east of Copenhagen.

LUNDEN, a town of Germany, in the circle of Lower Saxony, and dutchy of Holstein: east long. 8° 45', north lat. 54° 45'.

LUNDY, a little island in the mouth of the Bristol-channel: west long. 4° 50', north lat. 51° 25'.

LUNENBURG, the capital of the dutchy of the same name, thirty miles south-east of Hamburg: east long. 10° 20', north lat. 53° 35'.

LUNGS, a part of the human body, which is the cause or instrument of respiration. The lungs are the largest viscus of the thorax: they are situated in the two sides of it, with the heart as it were between them; and are connected by means of the mediastinum, with the sternum and vertebræ; with the heart, by means of the pulmonary vessels, and immediately with the aspera arteria. The colour of the lungs, in infants, is a fine florid red; in adults, it is darker; and in old people, livid, or variegated with black and white. When inflated, they have some resemblance to the hoof of an ox; and are convex on the upper side, and concave underneath. They are divided into two large lobes, the right and left; the left, which is the smaller, is divided again into two; and the right, which is larger, into three smaller ones. The membrane with which the lungs are surrounded, is continuous with the pleura. The substance of the lungs is spongeous, or vesiculous, and they seem, indeed, entirely composed of a number of small vesicles of a fleshy texture, and of a variety of vessels.

The vessels of the lungs are the bronchia, the bronchial artery and vein, the pulmonary artery and vein, the nerves, and the lymphatics. See BRONCHIA, &c.

The uses of the lungs are, 1. To perform the office of respiration, by which the blood is attenuated in the plexus of the arteries called the rete vasculosum. 2. To be assistant to the voice in speaking, and to the sense of smelling. They are also emunctories of the blood, and are of many other important services.

To give a more distinct idea of the form of the lungs and their situation, with respect to the parts to which they are united, we have given a plate of them, in which they are represented in two different views, see plate CLXIV. fig. 2. where, in n° 1. A is the larynx; B, the aspera arteria, or wind-pipe; CC, the lungs; D, the thymus; EE, two branches of nerves passing to, FFF, the diaphragm. In n° 2. A is also the larynx; B, the aspera arteria; CCCCC, the lobes of the lungs; D, the heart inclosed in the pericardium; E, the vena cava superior; F, the subclavian and carotid arteries.

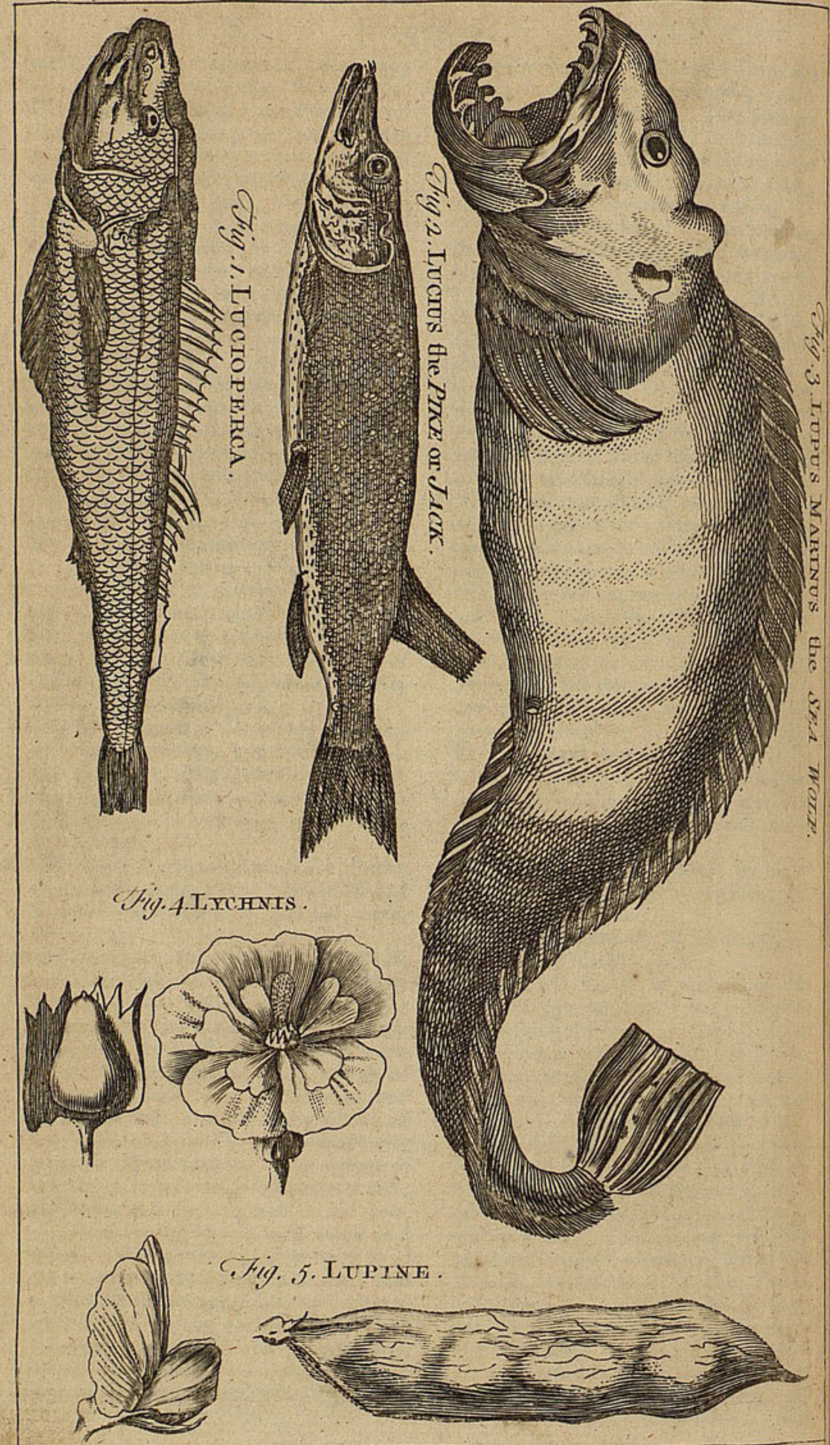
For the diseases in the lungs, see the articles ASTHMA, CONSUMPTION, PERIPNEUMONY, &c.

LUNG-WORT, *pulmonaria*, in botany. See the article PULMONARIA.

LUNISOLAR YEAR, in chronology, the space of 532 common years; found by multiplying the cycle of the sun by that of the moon. See CYCLE and YEAR.

LUNULA, in geometry, a plane figure like a crescent, or half-moon, for the quadrature of which, see QUADRATURE.

LUPERCALIA, a festival of the antient Romans in honour of the god Pan, observed on the 15th of February, and so called from luperci, the priests of that fabulous diety. This festival was instituted by Evander, who being driven from Arcadia, and received by king Faunus, introduced the worship of Pan in Italy: but the ceremonies and magnificence of this feast were encreased by Romulus. At this festival the luperci ran naked about the city, striking those they met


Fig. 1. LUCIOPERCA.
Fig. 2. LUCIUS the PIKE or JACK.
Fig. 3. LUPUS MARINUS the SEA WOLF.
Fig. 4. LYCHNIS.
Fig. 5. LUPINE.
T. Jefferys sculp.

with thongs cut out of the ſkins of goats: the women fooliſhly imagined that their receiving the ſacred ſtroke helped conception, and rendered their delivery more eaſy. Cicero, after ſpeaking with contempt of the luperci, in his ſecond Philippic, ridicules Anthony for running about as a lupercus. Nevertheleſs we find that magiſtrates and perſons of noble birth, were not aſhamed to act ſo ridiculous a part in the fight of all the citizens.

LUPIA, in ſurgery, a kind of encyſted tumour, called alſo talpa and teſtudo. See *Encyſted* TUMOURS.

LUPINE, *lupinus*, in botany, a genus of the diadelphia-decandria claſs of plants, the corolla whereof is papilionaceous; the vexillum is cordated, roundiſh, and emarginated: the alæ are oval, and almoſt of the ſame length with the vexillum; the carina is divided into two ſegments at the baſe: the fruit is a large, oblong, coriaceous, compreſſed, acuminated pod, containing only one cell: the ſeeds are numerous, roundiſh, and compreſſed. See plate CLXIII. fig. 5.

LUPULUS, the HOP, in botany, &c. See the article HOP.

LUPUS, the WOLF, in zoology. See the article WOLF.

LUPUS, in ornithology, the ſame with the monedula, or jackdaw. See JACKDAW.

LUPUS MARINUS, the SEA-WOLF, in ichthyology, conſtitutes a diſtinct genus of malacopterygious fiſhes, with a compreſſed body, and ſix or more oſſicles in the membrane of the gills. On the back there is only one fin, which extends almoſt from the head to the tail. It is a very ſingular fiſh, growing to four or five feet long. See plate CLXIII. fig. 3.

This fiſh is called anarrhichas, by the generality of authors.

LUPUS, in aſtronomy, a ſouthern conſtellation, conſiſting of nineteen, or, according to Flamſtead, of twenty-four ſtars.

LURE, in falconry, a device of leather, in the form of a bird, with two wings ſtuck with feathers, and baited with a piece of fleſh; wherewith to reclaim or call back a hawk, when at a conſiderable diſtance. See the article FALCONRY.

LURE, in geography, a town of Champaign, in France, thirty-five miles north-eaſt of Beſançon.

LUSATIA, a marquiſate of Upper Saxony, bounded by Brandenburg, on the north; by Sileſia, on the eaſt; by Bohemia, on the ſouth; and by the dutchy of Saxony, on the weſt: it is ſubject to the king of Poland.

LUSCINIA, the NIGHTINGALE, in ornithology. See NIGHTINGALE.

LUSIGNAN, a town of France, fifteen miles ſouth-weſt of Poictiers, ſituated under the meridian of London.

LUST, in the ſea-language. When a ſhip heels more one way than another, ſhe is ſaid to have a luſt that way.

LUSTRATION, in antiquity, ſacrifices or ceremonies by which the antients purified their cities, fields, armies, or people, defiled by any crime or impurity. Some of theſe luſtrations were public, others private. There were three ſpecies or manners of performing luſtration, *viz.* by fire and ſulphur, by water, and by air, which laſt was done by fanning and agitating the air round the thing to be purified. Some of theſe luſtrations were neceſſary, that is, could not be diſpenſed with, as luſtrations of houſes in time of a plague, or upon the death of any perſon: others again were done out of choice, and at pleaſure. The public luſtrations at Rome were celebrated every fifth year, in which they led a victim thrice round the place to be purified, and in the mean time burnt a great quantity of perfumes. Their country luſtrations, which they called ambarvalia, were celebrated before they began to reap their corn: in thoſe of the armies, which they called armiluſtria, ſome choſen ſoldiers, crowned with laurel, led the victims, which were a cow, a ſheep, and a bull, thrice round the army ranged in battle-array in the field of Mars, to which deity the victims were afterwards ſacrificed, after pouring out many imprecations on the enemies of the Romans. The luſtrations of their flocks were performed in this manner: the ſhepherd ſprinkled them with pure water, and thrice ſurrounded his ſheepfold with a compoſition of ſavin, laurel, and brimſtone ſet on fire, and afterwards ſacrificed to the goddeſs Pales an offering of milk boiled, wine, a cake and millet. As for private houſes, they were luſtrated with water, a fumigation of laurel, juniper, olive-tree, ſavin, and ſuch like; and the victim commonly was a pig. Luſtrations made for particular perſons were commonly called expiations, and the victims piacula. There were alſo a kind of luſtration uſed for infants, by which they were purified, girls the third, and boys the ninth day after their birth, which ceremony was performed

with pure water and ſpittle. See the article AMBARVALIA.

In their luſtratory ſacrifices the Athenians ſacrificed two men, one for the men of their city, and the other for the women. Divers of theſe expiations were auſtere: ſome faſted, others abſtained from all ſenſual pleaſures, and ſome, as the prieſts of Cybele, caſtrated themſelves. The poſtures of the penitents were different, according to the different ſacrifices. The prieſts changed their habits according to the ceremony to be performed; white, purple, and black, were the moſt uſual colours. They caſt into the river, or at leaſt out of the city, the animals or other things that had ſerved for a luſtration or ſacrifice of atonement, and thought themſelves threatned with ſome great misfortune when by chance they trod upon them. Part of theſe ceremonies were aboliſhed by the emperor Conſtantine, and his ſucceſſors; the reſt ſubſiſted till the gothic kings were maſters of Rome, under whom they expired, excepting what the popes thought proper to adopt and bring into the church.

For the luſtration, or rather expiation, of the antient Jews, ſee EXPIATION.

LUSTRE, the gloſs or brightneſs appearing on any thing, particularly on manufactures of ſilk, wool, or ſtuff. It is likewiſe uſed to denote the compoſition or manner of giving that gloſs.

The luſtre of ſilks is given them by waſhing in ſoap, then clear water, and dipping them in alum water cold. To give ſtuffs a beautiful luſtre, for every eight pounds of ſtuff allow a quarter of a pound of linſeed; boil it half an hour, and then ſtrain it through a cloth, and let it ſtand till it is turned almoſt to a jelly: afterwards put an ounce and a half of gum to diſſolve twenty-four hours; then mix the liquor, and put the cloth into this mixture; take it out, dry it in the ſhade, and preſs it. If once doing is not ſufficient, repeat the operation. Curriers give a luſtre to black leather firſt with juice of bar-berries, then with gum-arabic, ale, vinegar, and Flanders-glue, boiled together. For coloured leather, they uſe the white of an egg beaten in water. Moroccoes have their luſtre from juice of bar-berries and lemon or orange. For hats, the luſtre is frequently given with common water, ſometimes a little black dye is added: the ſame luſtre ſerves for furs, except that for very black furs they ſometimes prepare a luſtre of galls, copperas, roman alum, ox's marrow, and other ingredients.

LUSTRUM, in roman antiquity, a general muſter and review of all the citizens and their goods, which was performed by the cenſors every fifth year, who afterwards made a ſolemn luſtration. See the article LUSTRATION.

This cuſtom was firſt inſtituted by Servius Tullius, about 180 years after the foundation of Rome. In courſe of time the luſtra were not celebrated ſo often, for we find the fifth luſtrum celebrated at Rome only in the 574th year of that city.

LUSUC, or LUCKO, a city and biſhop's ſee of Poland: eaſt long. 25°, and north lat. 51° 5′.

LUTE, or LUTING, among chemiſts, a mixed, tenacious, ductile ſubſtance, which grows ſolid by drying, and being applied to the juncture of veſſels, ſtops them up ſo as to prevent the air from getting either in or out.

When the ſubject is merely aqueous, linſeed meal ground to fine powder, and well mixt or worked up into a ſtiff paſte with the white of an egg, makes a proper luting for the purpoſe; for being applied to the junctures of diſtilling veſſels, it grows hard with heat; and if it happens to crack, it is eaſily repaired by the application of freſh paſte, which ſoon grows ſolid as before. But a paſte made of the ſame meal, well worked up with cold water, very well anſwers the end in the diſtillation of all fermented inflammable ſpirits, and all volatile alkaline ſalts; but this paſte will not anſwer in the diſtillation of mild acids or acetous ſpirits, becauſe it ſoftens and diſſolves therewith, ſo as to let the fumes eſcape; in theſe caſes, therefore, a bladder ſteeped in water till it begins to grow ſlimy, makes an excellent luting, by being applied and preſſed wet upon the junctures of the diſtilling veſſels.

A luting that acquires a ſtony hardneſs, is neceſſary in the diſtillation of the foſſile acids, as thoſe of vitriol, ſea-ſalt, &c. which kind of luting is called the philoſophical luting, and may be prepared from the calx of copperas and quick-lime, by boiling the caput mortuum of vitriol in ſeveral parcels of water till it is thus thoroughly waſhed from its ſaline part, then drying the powder, and preſerving it in a cloſe veſſel. This powder is to be rubbed with an equal quantity of ſtrong quick lime, and wrought into a paſte with the whites of eggs firſt beat thin; and this luting is immediately to be

be applied to the junctures of the vessels, after their first being heated a little.

LUTE, is also a musical instrument with strings.

The lute consists of four parts, *viz.* the table, the body or belly, which has nine or ten sides; the neck, which has nine or ten stops or divisions, marked with strings; and the head, or cross, where the screw for raising and lowering the strings to a proper pitch of tone are fixed. In the middle of the table there is a rose or passage for the sound; there is also a bridge that the strings are fastened to, and a piece of ivory between the head and the neck to which the other extremities of the strings are fitted. In playing, the strings are struck with the right hand, and with the left the stops are pressed. The lutes of Bologna are esteemed the best on account of the wood, which is said to have an uncommon disposition for producing a sweet sound.

LUTHERANS, the christians who follow the opinions of Martin Luther, one of the principal reformers of the church in the sixteenth century.

This sect took its rise from the distaste taken at the indulgences which were granted in 1517, by pope Leo X. to those who contributed towards finishing St. Peter's church at Rome. John Stuptiz, vicar-general of the augustines in Germany, was the first who took occasion to declare against these abuses, for which purpose he made use of Martin Luther, the most learned of all the augustines. Luther was a native of Eisleben, in the county of Mansfield in Saxony, and taught divinity at the university of Wirtemberg; he mounted the pulpit, and declaimed vehemently against the abuse of indulgences, and even fixed ninety-five propositions upon the church doors of Wirtemberg, in order to their being considered and examined in a public conference: against these John Tetzel, a dominican, published a hundred and six positions at Francfort upon the Oder; and by virtue of his office of inquisitor, ordered those of Luther to be burnt: when his adherents, to revenge the affront, publicly burnt at Wirtemberg those of Tetzel. Thus war was declared between the dominicans and augustines, and soon after between the roman catholic and the lutheran party. In 1520, Luther sent his book De Libertate Christiana, to the pope; in which he grounds justification upon faith alone, without the assistance of good works; and asserts, that christian liberty rescues us from the bondage of human traditions, and particularly the slavery of papal impositions; and afterwards, in a remonstrance written in high Dutch, he proceeded to deny the authority of the church of Rome. He was the same year excommunicated by the pope; upon which Luther causing a large fire to be made without the walls of Wirtemberg, threw the pope's bull into it with his own hands, together with the decretals, extravagants, and clementines; and this example was followed by his disciples in other towns. The next year the emperor Charles V. ordered his books to be burnt, and put him under the ban of the empire as a heretic and schismatic; and about this time king Henry VIII. of England wrote against him in defence of the seven sacraments, to which Luther wrote a reply.

The elector of Saxony, who had for some time kept him concealed in his castle of Wesb rg, now gave him leave to reform the churches of Wirtemberg as he thought fit; when this reformer proposed that the bishops, abbots, and monks should be expelled; that all the lands and revenues of the bishoprics, abbies, and monasteries, should escheat to the respective princes; and that all the convents of mendicant friars should be turned into public schools and hospitals: this year, Luther had the satisfaction to see a league contracted between Gustavus king of Sweden, and Frederick king of Denmark, who both agreed to establish lutheranism in their dominions: and now Luther's persuasion, which from the Upper Saxony had spread into the northern provinces, began to be perfectly settled in the dutchies of Lunenburg, Brunswick, Mecklenburgh and Pomerania, and in the archbishoprics of Magdeburg and Bremen; in the towns of Hamburgh, Wismar, Rostock, and along the Baltic as far as Livonia and Prussia. Luther maintained the doctrine of consubstantiation; and at a general diet at Ratisbon for reconciling both parties, the divines could agree to no more than five or six articles concerning justification, free-will, original sin, baptism, good works, and episcopacy.

LUTHERN, in architecture, a kind of window over the corniche, in the roof of a building; standing perpendicularly over the naked of a wall, and serving to illuminate the upper story.

Lutherns are of various forms, as ſquare, ſemi-circular, round, called bulls-eyes, flat arches, &c.

LUTON, a market-town, fourteen miles ſouth of Bedford.

LUTRA, the OTTER, in zoology. See the article OTTER.

LUTTERWORTH, a market-town, twelve miles ſouth of Leiceſter.

LUTUM, among chemiſts, denotes a lute; and lutum ſapientiæ, the hermetical ſeal. See LUTE and HERMETICAL.

LUTZELSTEIN, a town of Germany, ſeventeen miles north of Straſburg.

LUTZEN, a town of Upper Saxony, in Germany, eight miles weſt of Leipſic.

LUXATION, *luxatio*, in ſurgery, is when any bone is moved out of its place, or articulation, ſo as to impede or deſtroy its proper motion or office: hence, it appears, that luxations are peculiar to ſuch bones as have moveable joints; but, in a common way of ſpeaking, people term it a luxation, when the bones of the noſe are diſplaced, or when epiphyſes are ſeparated from their bones in infants.

Thoſe, therefore, who deſire to be fully verſed in the knowledge and cure of luxations, ſhould have a clear idea and remembrance of the form of each articulation, with its ligaments and muſcles; which can only be obtained by a frequent and diligent inſpection of anatomical diſſections. See the article ANATOMY.

Luxations are generally diſtinguiſhed into perfect and imperfect: theſe laſt are when the bones are only diſlocated in part, yet ſo as that they cannot perform their office; whereas, in perfect luxations, the bones are wholly ſeparated or diſplaced from their articulation with each other.

As to the method of treating luxations, it is much the ſame with that uſed in fractures: for in both caſes, the whole deſign of the ſurgeon is, 1. To reſtore the bone to its place, firſt by extenſion, and then by reduction with his hands. 2. To preſerve and retain what is ſo replaced, in their natural poſition. 3. To prevent and cure the ſeveral ſymptoms uſually attending them.

To replace a luxated bone, the ſurgeon ought to regulate the aſſiſtant's extenſion, by ordering it to be ſtrong enough, and in a right direction; and, in the mean time, he is to compreſs the articulation gently with his hands and fingers, till he find the elapſed bone recover its right place; which is known to have been effected, if it be heard to ſnap in the reduction, or by the limb's being able to perform its office. In caſes where the luxation is attended with a fracture, the reduction muſt be put off till the fracture be well joined by a firm callus.

When the bones are properly reduced, they muſt be retained in their places by proper bandages and reſt; and when theſe happen in the lower extremities, the patient ſhould reſt a few days in his bed; moving the limb gently as ſoon as he finds it capable, and afterwards he may riſe and walk cautiouſly.

On the other hand, when the luxation is inveterate, and the ligaments have been much ſtretched by violent and long continued diſtention, it is highly neceſſary to make uſe of ſome bandage after reduction; and in the mean time, to bathe the part well with ſpirit of wine, hungary-water, or ſome other warm and ſtrengthening medicine, by which means the ligaments uſually become very firm and ſtrong.

As to the ſymptoms which happen before or after the reduction of a luxation, ſuch as inflammations, tumours, convulſions, hæmorrhages, &c. they muſt be treated in the manner directed under theſe articles. If a ſlight fever ſhould attend, bleeding, a thin diet, and cooling medicines are to be uſed. If an abceſs ſhould be formed, it ſhould be opened as ſoon as ripe, leſt the articulation and bones be corroded, which often make amputation of the limb neceſſary. If a luxation is attended with a fracture, it ſhould be reduced firſt, and the fracture ſet afterwards: and, laſtly, if the bones be diſlocated with ſuch violence as to break and deſtroy the ligaments, tendons, and adjacent ſkin, the only method left is ſpeedily to amputate the limb. See the article AMPUTATION.

Luxations of the jaw, clavicle, arm, and hand, are more readily reduced on a low ſtool; ſuch as happen in the vertebræ or thighs, on a table; ſuch as happen in the legs or feet, on a bed; and, laſtly, thoſe which happen on the ſhoulders or vertebræ of the neck, are moſt commodiouſly reduced on the floor. See JAW, HUMERUS, THIGH, VERTEBRÆ, &c.

LUXATION *of the ancle*. See the article ANCLE LUXATED.

LUXEMBURG, the capital of the dutchy of the ſame name, ſituated an hundred miles ſouth-eaſt of Bruſſels, is a ſmall but ſtrong fortreſs: eaſt long. 6° 8′, north lat. 49° 45′.


Fig. 1. LOXIA, the CROSS-BILL.
Fig. 3. LYCOPERDON.
N°1.
N°2.

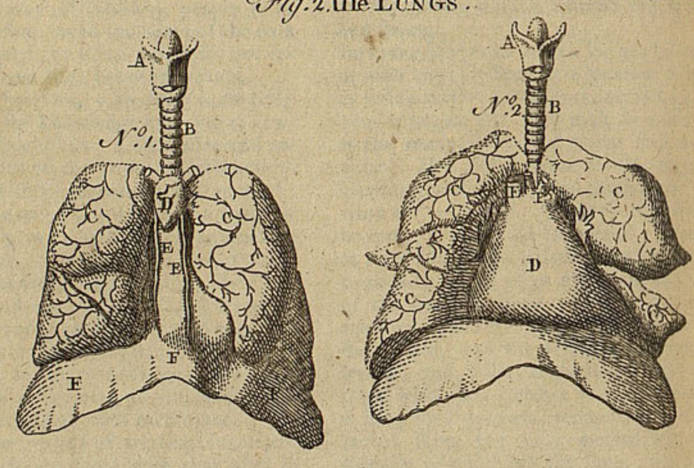

Fig. 2. the LUNGS.
A
B
N°1.
N°2.
C
D
E
F


Fig. 4. LYCOPODIUM
N°1.
N°2.

T. Jefferys

LUZZARA, a town of Italy, twelve miles south of Mantua.

LYBIA, a name antiently given to all the coast of Barbary, especially that part lying westward of Egypt.

LYCANTHROPY, in medicine, a deep melancholy, wherein the patients imagine themselves wolves; and accordingly shun company, and go into woods and lonely places, howling like wolves. See the article MELANCHOLY.

LYCAONIA, an antient province of lesser Asia, whereof Cogni is now the capital.

LYCEUM, in grecian antiquity, an academy situated upon the banks of the Ilissus at Athens. It was composed of porticos and walks, where Aristotle taught philosophy; walking there constantly every day till the hour of anointing, whence he and his followers were called peripatetics. See the article PERIPATETIC PHILOSOPHY.

LYCHAM, or LITCHAM, a market-town of Norfolk, eighteen miles west of Norwich.

LYCHNIS, CATCH-FLY, or CUCKOW-FLOWER, in botany, a genus of the decandria pentagynia class of plants, the flower of which consists of five petals; the ungues of which equal the cup in length, and their limb is plain; the nectarium is composed of two denticles, placed in the neck of each petal: the fruit is a capsule, approaching to an oval figure, covered, and containing only one cell, with numerous roundish seeds. See plate CLXIII. fig. 4.

LYCIUM, AVIGNON-THORN, in botany, a genus of the pentandria-monogynia class of plants, the corolla of which is a single funnel-like petal, with a cylindraceous tube, and the limb divided into five segments: the fruit is a roundish bilocular berry, containing a great many kidney-shaped seeds.

LYCODONTES, in natural history, the petrified teeth of the lupus-piscis, or wolf-fish, frequently found fossile. They are of different shapes, but the most common kind rise into a semiorbicular form, and are hollow within, somewhat resembling an acorn-cup: this hollow is found sometimes empty, and sometimes filled with the stratum in which it is immersed. Many of them have an outer-circle, of a different colour from the rest.

LYCOPERDON, PUFF BALL, in botany, a genus of funguses, of a fleshy substance like other mushrooms, and roundish shape. They are sometimes sessile, and sometimes stand on a thick pedicle: they produce separate male and female flowers, contained in the cellular fungous substance; which remains a long time confused, and the fructifications not formed; and when they are formed, and the cells distinct, it is but a very short time before the very matter of the cells breaks to powder, and the seeds fall out of the cavities of the placentæ; and the whole matter, powder, seeds, and filaments of the placentæ, are discharged altogether in form of a fine dust.

Of this genus there are a great many species, the most remarkable of which is the starry lycoperdon, or puff-ball, with multifid rays, and a stellated osculum. See plate CLXIV. fig. 3. n° 1. to which we may add the pediculated lycoperdon, with a hairy lacerated volva, *ibid.* n° 2.

LYCOPODIUM, WOLF'S CLAW-MOSS, in botany, a genus of mosses consisting of branches, furnished with leaves, and producing spikes formed of squamæ, of a different figure from the leaves; at the bases of which are placed capsules, of a kidney-like shape, which have no cup or vagina; and, when ripe, open longitudinally into two parts, and discharge a great quantity of fine powder.

The lycopodiums have all one general appearance, by which they may be distinguished to belong to the same family; only in some, the spikes are continuous to the rest of the stalk, and in others, they are supported on peculiar pedicles. See plate CLXIV. fig. 4. n° 1 and 2.

LYCOPSIS, in botany, a genus of the pentandria-monogynia class of plants, comprehending the echioides and buglossoides of Rivinus, and the buglossum of Morison; its corolla consists of a single petal, with a cylindraceous tube, and a semiquinquifid limb: the calyx answers to the purpose of a pericarpium, containing four oblong seeds. It is nearly allied to echium, or viper's bugloss. See the article ECHIUM.

LYCOPUS, WATER HOREHOUND, in botany, a genus of the diandria-monogynia class of plants, the flower of which consists of a single petal, with a cylindraceous tube, and a quadrifid limb: there is no fruit; the seeds, which are four and roundish, being lodged in the cup.

LYDIA, an antient province of lesser Asia, in which was the city of Philadelphia.

LYGEUM, in botany, a genus of the triandria-monogynia class of plants, the calyx of which is a single leafed, convolute, oval,

oval, acuminated ſpatha : the corollæ are two in number, equal, and placed on the germen : the fruit is an oblong very hairy nut, containing two cells, in which is a ſingle, oblong, linear ſeed, convex on one ſide, and plane on the other.

LYING-IN-WOMEN, in midwifery, thoſe lately delivered of a child. See the articles DELIVERY, LOCHIA, &c.

After pains are the moſt common complaint to which lying-in-women are ſubject; and as theſe are uſeful, ſerving to promote the lochia, and the diſcharge of clotted blood, nothing more is neceſſary than to keep the woman warm, by applying a warm cloth to the belly. Exceſſive after-pains are greatly mitigated by carminative, aromatic, and nervous medicines; and in caſe the woman is coſtive, an emollient clyſter is proper.

In difficult labours, the vagina and external parts are ſubject to contuſions, inflammations, and dilacerations. In caſe of contuſion, La Motte recommends embrocations with warm wine, with a little chervil in it; and as to lacerations of the perinæum or vagina, the ſame author adviſes a reunion by the ſuture, whilſt the wound is recent. Contuſions, inflammations, and even mortifications, are often cauſed by a midwife's too rudely handling the parts; in which caſes, bleeding, ſcarification, and embrocation become neceſſary. In ſlighter excoriations, it will be ſufficient to bathe the parts with warm milk, barley-water, a decoction of liquorice and chervil; and afterwards, to embrocate with wine and chervil.

In caſe of a bilious diarrhœa, which often proves a very terrible ſymptom, it is uſual to give abſorbent powders, and afterwards the bitter extracts, with ſmall doſes of rhubarb. Aſtringents and an improper uſe of opium are very dangerous. Flatulencies are cured by carminatives, aromatics, and abſorbent powders.

LYME, a borough and port-town of Dorſetſhire, eaſt long. 3° 5′, and north lat. 50° 44′.

It ſends two members to parliament.

LYMPH, *lympha*, a fine fluid, ſeparated in the body from the maſs of blood, and contained in peculiar veſſels.

Dr. Keil ſays, that the lymph being chemically examined, will be found to contain a great deal of volatile, but no fixed ſalt, ſome phlegm, ſome ſulphur, and a little earth. The uſe of the lymph, he obſerves, may be gathered from the conſideration of the parts into which it diſcharges itſelf: that which comes from the head, neck, and arms, is thrown into the jugular and ſubclavian veins; all the lymphatics which the parts in the cavity of the thorax ſend out, empty themſelves into the thoracic duct; and the lymph from all the reſt of the body, flows to the receptacle of the chyle; ſo that there can be no doubt but its chief uſe is to dilute and perfect the chyle before it mixes with the blood. Now the whole lymph which is ſeparated from the blood, being requiſite for this uſe, it is plain there could be no glands in the abdomen, appropriated for the ſeparation of the whole lymph, but what muſt have had a very great ſhare of the blood which paſſes through the aorta, in order to ſeparate ſo great a quantity of lymph; but the liver and kidneys requiring alſo a great quantity of blood, and which could not be avoided, nature choſe to ſeparate the lymph from the blood which goes to all the parts of the body, rather than appoint particular glands for it in the abdomen, which would have been more at hand, but would have robbed the other parts of a large quantity of blood, and occaſioned a very unequal diſtribution of of it.

For the lymphatic glands, ſee GLAND.

There are three ſorts of veſſels which go by the name of lymphatics, whereas formerly that word was uſed to ſignify the tranſparent veſſels, which accompany the lymphatic glands. The original ſources of theſe veſſels, Winſlow obſerves, are very difficult to be found out, and even their diſtribution through the body has not been ſufficiently traced, to enable us to deſcribe them particularly. As to their termination, we are ſure, that, for the moſt part, they end in the thoracic duct. Beſides theſe veſſels which accompany the glands, there are others, of the ſame ſtructure found on the ſeveral viſcera, where no lymphatic glands have yet been diſcovered. We meet with them in very great numbers in the external membrane of the liver, and in the duplicature of the ſuperior membranous ligament of this organ. Several diſcoveries about theſe veſſels have been made in brutes.

The third ſort of veſſels, termed lymphatic veſſels, are the ſmall arteries and veins which in the natural ſtate tranſmit only the ſerous part of the blood. Theſe veſ-

fels differ from thofe of the firft, in the fmallnefs of their diameter, and in their ftructure and fituation. All thefe little arteries and veins are uniform, extremely narrow, and though their fides are not thinner than thofe of the valvular lymphatics, yet their diameters are generally lefs. The other lymphatics are full of valves and very thin, but they are not narrow in proportion. The arterial and venous lymphatics are found on the parts which are naturally white, as on the fkin, and the white of the eye; and their origin are eafily difcoverable; but the valvular lymphatics are confined to the internal parts of the body, and are found on the parts of all colours; but we cannot eafily trace them to their original ftate.

LYMPHATICS, or LYMPHEDUCTS, in anatomy. See the preceding article.

LYNN-REGIS, a port-town of Norfolk, fituated at the mouth of the river Oufe, on a bay of the German fea, thirty-two miles weft of Norwich.

It fends two members to parliament.

LYNX, or OUNCE, in zoology, a fpecies of the felis kind, with a truncated tail, a brown body fpotted with black; the head is large, but not very long; the forehead is flat, the eyes are large and fierce; the ears are very large and open, but they terminate in a point at the top, and are there ornamented with a pencil of fine black hairs; the mouth is furnifhed with very terrible teeth, and there are whifkers about it, as alfo over the eyes; the neck is long and thick, the breaft large and broad, the legs ftrong, the claws terrible, the tail fhort and abrupt; and the whole animal large and robuft, fomewhat lefs than the lion, very fierce, and remarkable for the quicknefs of its fight.

LYON, or LION. See the article LION.

LYON, or LION, *King at arms*. See KING *at arms*, and COLLEGE *of heralds*.

LYONS, the capital of the Lyonois, a province of France, bounded by Orleanois and Burgundy on the north, by la Breffe and Dauphine on the eaft, by Languedoc and Guienne on the fouth, and by another part of Guienne and Orleanois on the weft. This city lies upon the confluence of the rivers Rhone and Soan, in eaft long. 4° 55′, and north lat. 45° 50′. Next to Paris, it is efteemed the place of greateft trade in France.

LYRA, in ichthyology, the name of a fifh of the cuculus or gurnard-kind, of which there are two fpecies, the one called tibicen. See the article TIBICEN.

The other, the lyra cornuta, or horned harp-fifh, of an octogonal form, covered all over with bony fcales, which are of a rhomboidal figure, each having in its middle a fharp and ftrong prickle, bending backwards; its fnout divides towards the extremity into two large horns, on which are placed two perpendicular fpines, which with a third above, makes an acute angle: its mouth is large, but it has no teeth.

LYRA is alfo the name of a beautiful feafhell, of the genus of the concha globofa, or dolium.

LYRE, *lyra*, a mufical inftrument of the ftring-kind, much ufed by the antients. See the article CITHARA.

Ammianus Marcellinus fays, that there were lyres as big as calafhes. Quintilian fays, that the muficians having divided the founds of the lyre into five fcales, each of which had feveral degrees, they have placed between the ftrings which give the firft tones of each of thofe fcales, other ftrings which gave intermediate founds; and thefe ftrings have been multiplied in fuch a manner, that to pafs from one of the five mafter-ftrings to the other, there are as many ftrings as there are fcales. The crier who proclaimed the laws, among the Greeks, was accompanied by a harper or player on the lyre.

From the lyre, which all agree to have been the firft inftrument of the ftring-kind in Greece, arofe an infinite number of others, differing in fhape and number of ftrings, as the pfalterion, trigon, fambucus, pectis, magadis, barbiton, teftudo, (the two laft are ufed promifcuoufly by Horace with cythara and lyra) epigonium, fimmicium, and pandoron; which were all ftruck with the hand, a plectrum or a little iron-rod. We have no fatisfactory account of their fhape, ftructure, or number of ftrings; their bare names only have been tranfmitted to us by the antients. We find, indeed, numbers of inftruments on old medals; but whether they are any of thefe, we cannot find out. The modern lyre, or welfh harp, confifting of forty ftrings, is fufficiently known.

The lyre among poets, painters, ftatuaries, carvers, &c. is attributed to Apollo and the Mufes.

LYRE, *lyra*, in aftronomy, a conftellation of

of the northern hemisphere, the number of whose stars, in Ptolemy's and Tycho's catalogues are only 10, but 19 in the Britannic catalogue.

LYRIC, in general, signifies something sung or played on the lyre: but it is more particularly applied to the antient odes and stanzas, answering to our airs and songs, and may be played on instruments. This species of poetry was originally employed in celebrating the praises of gods and heroes, though it was afterwards introduced into feasts and public diversions. Mr. Barnes shews how unjust it is to exclude heroic subjects from this kind of verse, which is capable of all the elevation such matters require. The characteristic of this kind of poetry is, according to Trap, the sweetness and variety of the verse, the delicacy of the words and thoughts, the agreeableness of the numbers, and the description of things most pleasing in their own natures. At first the lyric verse was only of one kind, but afterwards they so continued to vary the feet and numbers, that the variety of them now are almost innumerable.

This kind of poem is distinguished from all other odes by the happy transitions and digressions which it beautifully admits, and the surprising and natural easy returns to the subject, which is not to be obtained without great judgment and genius.

The lyric is, of all kinds of poetry, the most poetical, and is as distinct, both in style and thought, from the rest, as poetry is in general from prose: it is the boldest of all other kinds, full of rapture, and elevated from common language the most that is possible: some odes there are likewise, in the free and loose manner, which seems to avoid all method, and yet are conducted by a very clear one; which affects transitions seemingly without art, but for that reason have the more of it; which are above connection, and delight in exclamations and frequent invocations of the muses; which begin and end abruptly, and are carried on through a variety of matter with a sort of divine pathos, above rules and laws, and without regard to the common forms of grammar. Pindar has set his successors the example of digressions and excursions. To write a lyric poem are required not only a flowing imagination, brightness, life, sublimity, and elegance, but the nicest art and finest judgment, so as to seem luxuriant, and not be so; and under the shew of transgressing all laws, to preserve them.

LYSIMACHIA, WILLOW-HERB, in botany, a genus of the pentandria monogynia class of plants, the corolla whereof consists of a single petal; the tube is scarce discernible; the limb is divided into five ovato-oblong segments; the fruit is a capsule of a globose figure, composed of ten valves, and having only one cell; the seeds are numerous, and angulated, the receptacle globose, large, and punctuated.

LYTHRUM, in botany, a genus of the dodecandria-monogynia class of plants, the corolla whereof consists of six oblong, obtuse, patent petals, inserted by their ungues into the segments of the cup; the fruit is an oblong, acuminated, and bilocular capsule, containing a great number of small seeds.

M.

M, Or m, the twelfth letter and ninth consonant of our alphabet: it is a liquid and labial consonant, pronounced by striking or moving the under lip against the upper one: its sound is always the same in english, and it admits no consonant after it in the beginning of words and syllables, except in some greek words, nor does it come after any in that case. It suffers not the sound of n, coming after it, to be heard, as in autumn, solemn, *&c.*

As a numeral, M stands for mille, a thousand; and with a dash over it, thus, $\overline{M}$, for a thousand times a thousand, or, 1000000. Used as an abbreviature, M, signifies Manilius, Marcus, Martius, Mucius; and M'. Manius; M. B. mulier bona; Mag. Eq. magister equitum; Mag. Mil. magister militum; M. M. P. manu mancipio potestate; M. A. magister artium; M. S. manuscript; and M. S. S. manuscripts, in the plural. In the prescription of physicians, M. stands

ftands for manipulus, a handful; and fometimes for mifce, or mixtura: thus M. F. Jupalium, fignifies mix and make into a julep. In aftronomy, &c. M is ufed for meridian or meridional; and, in law, M. is the ftigma burnt on the brawny part of the left thumb of a perfon convicted of manflaughter.

MABBY, according to Mr. Boyle, is a kind of wine made from potatoes, and faid to be ufed in Barbadoes.

MAC, an irifh word, fignifying a fon, frequently added to the beginning of furnames, as Mac Donald, for Donaldfon; Mac Laurin, for Laurence's fon, &c.

MACAO, an ifland of China, in the province of Canton, fifty miles fouth of Canton.

MACAO, or MACAW, in ornithology, a name given to the larger fpecies of parrots with very long tails. See PARROT, and ERYTHROCYANEUS.

MACARONIC, or MACARONIAN, an appellation given to a burlefque kind of poetry, made up of a jumble of words of different languages, and words of the vulgar tongue latinized.

The Italians are faid to have been the inventors of it. The Germans, French, Spaniards, &c. have alfo had their macaronic poets; nor is Great Britain outdone in this refpect, witnefs Drummond of Hauthornden's poem called Polemo Middinia, which begins thus:

Nymphæ, quæ colitis highiffima monta Fifæa,
Seu vos Pittenweema tenet, feu Crelia crofta, &c.

MACAROON, a delicious cake, faid to be the favourite of the Italians, as pudding is in England; from whence it is remarked, that the merry-andrews of all nations are called by the national character: thus, in England, they are called jack-puddings; in Holland, pickle herrings; in Italy, macaroons, &c.

MACASSER, a large ifland in the Eaft-Indies. See the article CELEBES.

MACCABEES, two apocryphal books of fcripture; fo called from Judas Mattathias, furnamed Maccabeus. The firft book of the Maccabees is an excellent hiftory, and comes neareft to the ftyle and manner of the facred hiftorians of any extant. It contains the hiftory of forty years, from the reign of Antiochus Epiphanes to the death of Simon the high prieft; that is, from the year of the world 3829 to the year 3869, 131 years before Chrift. The fecond book of the Maccabees begins with two epiftles fent from the Jews of Jerufalem to the Jews of Egypt and Alexandria, to exhort them to obferve the feaft of the dedication of the new altar, erected by Judas on his purifying the temple. After thefe epiftles follows the preface of the author to his hiftory, which is an abridgment of a larger work, compofed by one Jafon, a Jew of Cyrene, who wrote the hiftory of Judas Maccabeus, and his brethren, and the wars againft Antiochus Epiphanes, and Eupator his fon. This fecond book does not, by any means, equal the accuracy and excellency of the firft. It contains a hiftory of about fifteen years, from the execution of Heliodorus's commiffion, who was fent by Seleucus to fetch away the treafures of the temple, to the victory obtained by Judas Maccabeus over Nicanor; that is, from the year of the world 3828, to the year 3843, 147 years before Chrift.

Upon the whole, it muft be acknowledged, that there are great errors, and often different and even contradictory accounts to be found in them, efpecially in the fecond, arifing probably either from ignorance of the greek and roman hiftory, or from national prejudice and an immoderate partiality in favour of the jewifh nation.

The romanifts receive four books of the Maccabees, of which the two firft, already mentioned, are with them canonical, and the two laft apocryphal.

MACCLESFIELD, a market town of Chefhire, thirty-five miles eaft of Chefter, from whence the noble family of Parker take the title of earl.

MACE, the fecond coat or covering of the kernel of the nutmeg, is a thin and membranaceous fubftance, of an oleaginous nature and a yellowifh colour; being met with in flakes of an inch and more in length, which are divided into a multitude of ramifications. It is of an extremely fragrant, aromatic and agreeable flavour, and of a pleafant, but acrid and oleaginous tafte. See the article NUTMEG.

Mace is carminative, ftomachic and aftringent; and poffeffes all the virtues of nutmeg, but is lefs aftringent. Nurfes are faid to apply oil of mace, by expreffion, to children's navels to eafe their gripes, and that often with fuccefs; and rubbed on the temples, it is faid to promote fleep. Its oil, by diftillation, is very proper to be added to the ftronger cathartics in form of pills by way of corrective.

Mace

Mace, the pound, pays on importation, 3 s. $0\frac{77\frac{2}{5}}{100}$ d. and draws back, on exportation, 2 s. $8\frac{66\frac{2}{5}}{100}$ d.

MACEDONIA, a province of European Turky, bounded by Servia and Romania, on the north and eaſt; by the gulphs of Salonichi, Conteſſa and Theſſaly, on the ſouth; and by Albania and Epirus on the weſt.

MACERATA, a city of the marquiſate of Ancona, in the territories of the pope: eaſt long. 15°, north lat. 43°, 15′.

MACERATION, in pharmacy, is an infuſion of, or ſoaking ingredients in water, or any other fluid, in order either to ſoften them, or draw out their virtues. Lemery defines maceration to be a ſort of digeſtion confined to thick ſubſtances: thus, ſays he, when roſe-leaves are put into fat, in order to make oil of roſes, this mixture is, for ſome days, expoſed to the ſun, in order to macerate, that the quality of the roſes may be the better conveyed to the fat.

MACHIAN, a ſmall iſland of the Moluccas, which produces the beſt cloves: it is ſituated under the equator, in 125° eaſt long. and is ſubject to the Dutch.

MACHINE, *machina*, in general, whatever hath force ſufficient to raiſe or ſtop the motion of a heavy body.

Machines are either ſimple or compound; the ſimple ones are the ſeven mechanical powers, *viz.* lever, ballance, pully, axis and wheel, wedge, ſcrew, and inclined plane. See the articles POWER, LEVER, BALLANCE, &c.

From theſe the compound ones are formed by various combinations, and ſerve for different purpoſes; in all which, the ſame general laws take place, *viz.* that the power and weight ſuſtain each other, when they are in the inverſe proportion of the velocities they would have in the directions wherein they act if they were put in motion. Now, to apply this law to any compound machine, there are four things to be conſidered: 1. The moving power, or the force that puts the machine in motion; which may be either men or other animals, weights, ſprings, the wind, a ſtream of water, &c. 2. The velocity of this power, or the ſpace it moves over in a given time. 3. The reſiſtance, or quantity of the weight to be moved. 4. The velocity of this weight, or the ſpace it moves over in the ſame given time.

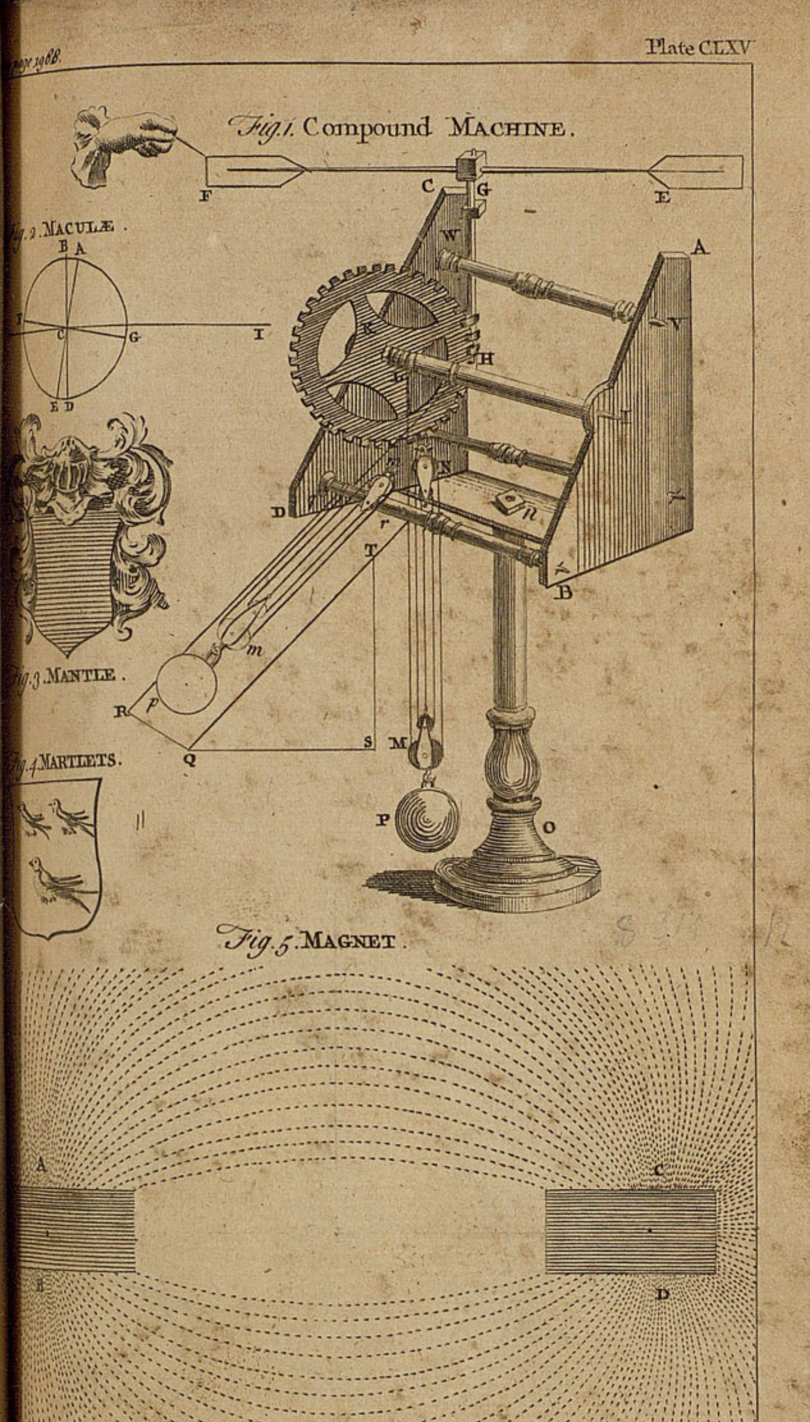
The two firſt of theſe quantities are always in the reciprocal proportion of the two laſt; that is, the product of the firſt two muſt always be equal to that of the laſt: hence, three of theſe quantities being given, it is eaſy to find the fourth; for example, if the quantity of the power be 4, its velocity 15, and the velocity of the weight 2, then the reſiſtance, or quantity of the weight will be equal to $\frac{4 \times 15}{2} = \frac{60}{2} = 30$.

Compound machines are extremely numerous, as mills, pumps, wheel-carriages, clocks, fire-engines, &c. See the articles ENGINE, MILL, PUMP, WATER-WORKS, &c.

In plate CLXV. fig. 1. is a compound machine, wherein are combined all the ſimple mechanical powers. It is contained in a frame A B C D, faſtened by the nut *n* upon the ſtand *n* O, and held together by the pillars V W and B *q*. 1. The piece E F, whoſe fanes, or flies, may be put in motion by the wind, or drawn by a hair faſtened at F, repreſents the lever and ballance. 2. At right angles to this is joined the perpendicular ſpindle G H, having upon it the endleſs ſcrew H, which may alſo be conſidered as a wedge. 3. This endleſs ſcrew, or worm, takes the ſkew teeth of the wheel K, which is the axis in peritrochio; and, in turning round, winds up the ſtring L M upon its axis, which paſſing round the pullies at M and N, or drawing by a tackle of five, raiſes the weight P. But as the ſcrew has no progreſſive motion on its axis, it cannot here be ſaid to take in the inclined plane; therefore, to make this engine take in all the mechanical powers, we may add the inclined plane *r q* Q R, by making it reſt on the ground at Q R, and on the pillar *q* B at *r q*; whereby the force of the power, drawing at F, will be farther increaſed in the ratio of Q T, the length of the plane, to T S, its height.

The whole force gained by this machine, is found by comparing the ſpace gone through by the point F, with the height that the weight is raiſed in any determinate number of revolutions of F; and this force is ſo conſiderable, that an hundred pounds weight at P will be eaſily raiſed by the hair of a man's head drawing at F.

In cranes, and many other machines, the power is ſo applied to one part of the machine


Fig. 1. Compound Machine.
F
C
G
E
W
A
K
H
V
D
n
r
T
B
m
R
p
S
M
Q
P
O
Fig. 2. Maculæ.
B A
C
G
I
E D
Fig. 3 Mantle.
Fig. 4 Martlets.
Fig. 5. Magnet.
A
C
D
J. Jefferys sculp.

machine as to act immediately upon the weight; but there are others, as the engine for driving piles, in which the force of the power is accumulated before the weight is acted on at all. See the articles CRANE, ENGINE, FLY, &c.

As defcriptions and draughts of machines, inftruments, tools, &c. muft be very acceptable to the public, we have, through the courfe of this work, given the conftructions and ufes of a very great number; fome from Belidor's Architecture hydraulique, others from Defaguliers, Hales, the Philofophical Tranfactions, 'S Gravefande, Mufchenbroek, Martin, Moxon, Varignon's Mechanique, Heifter's Surgery, with other books both on the liberal and mechanical arts; and where thefe proved deficient, fome have been taken from original defigns.

MACHINERY, in epic and dramatic poetry, is when the poet introduces the ufe of machines, or brings fome fupernatural being upon the ftage, in order to folve fome difficulty, or to perform fome exploit out of the reach of human power. The antient dramatic poets never made ufe of machines, unlefs where there was an abfolute neceffity for fo doing; whence the precept of Horace,

Nec Deus interfit, nifi dignus vindice nodus—inciderit.

It is quite otherwife with epic poets, who introduce machines in every part of their poem; fo that nothing is done without the intervention of the gods. In Milton's Paradife Loft, by far the greater part of the actors are fupernatural perfonages: Homer and Virgil do nothing without them; and in Voltaire's Henriade, the poet has made excellent ufe of St. Louis.

As to the manner in which thefe machines fhould act, it is fometimes invifibly, by fimple infpirations and fuggeftions; fometimes by actually appearing under fome human form; and, laftly, by means of dreams and oracles, which partake of the other two. However, all thefe fhould be fo managed as to keep within the bounds of probability.

MACHINLETH, a market town of north Wales, twenty-eight miles weft of Montgomery.

MACKERAN, or MACKAN, the capital of a province in Perfia of the fame name; fituated in eaft long. 66°, and north lat. 26°.

MACKREL, in ichthyology, a fpecies of fcomber, with five pinnules at the extremity of the back, and a fpine at the anus. See the article SCOMBER.

MACRO, or MACRONISSA, an ifland of the Archipelago, twenty miles eaft of Athens.

MACROCERCI, in zoology, a name given to that clafs of animalcules, with tails longer than their bodies. See the article ANIMALCULE.

MACROCOSM, an affected term ufed by fome for the univerfe, in contradiftinction to microcofm. See MICROCOSM.

MACROLOGY, in rhetoric, a too copious ftyle. See the article STYLE.

MACROPYRENIUM, in natural hiftory, a genus of foffils, confifting of cruftated feptariæ, with a long nucleus ftanding out at each end of the mafs. See the article SEPTARIÆ.

Of this genus there is only one known fpecies. This is one of the moft fingular and extraordinary bodies of the mineral kingdom: it is of a clofe, compact, and firm texture, of a very rugged and unequal furface, ever of a determinate and very fingular fhape, which is an oblong and cylindric figure: in fize, it is one of the moft determinate and regular of all the native foffils: its length is between feven and eight inches, and its diameter, in the center or thickeft part, three inches; when broken, we find it compofed of a central nucleus, of a ferrugineous colour, naturally hollow, but commonly filled up with an earthy matter; this is inclofed in a thin cruft of a brownifh matter, of almoft equal hardnefs; thefe are furrounded with a fingle, double, or, in fome fpecimens, a triple circular feptum, of an elegant columnar fpar, which is again environed by two thick crufts of a brownifh matter of the kind of the reft of the feptariæ; this makes the body of the mafs, and is divided by four or five other fepta, parting like rays from the circular one, and making ftraight towards the circumference of the ftone; and the whole of this is furrounded with a rugged and unequal, white, brownifh coat of about one third of an inch in diameter; the cavity of the central nucleus is of half an inch diameter, and the nucleus itfelf is a very heavy body, of great hardnefs, and capable of a fine polifh.

MACROTELOSTYLA, in natural hiftory, a name of a genus of cryftals, which are compofed of two pyramids, joined to the end of a column; both the pyramids, as alfo the column, being hexangular

hexangular, and the whole body consequently composed of eighteen planes. See the article CRYSTAL.

MACULÆ, in astronomy, dark spots appearing on the luminous faces of the sun, moon, and even some of the planets; in which sense they stand contradistinguished from faculæ. See FACULÆ.

These spots are most numerous and easily observed in the sun. It is not uncommon to see them in various forms, magnitudes and numbers, moving over the sun's disk. They were first of all discovered by the lyncean astronomer Galileo, in the year 1610, soon after he had finished his new invented telescope. That these spots adhere to, or float upon, the surface of the sun, is evident for many reasons. 1. Many of them are observed to break out near the middle of the sun's disk; others to decay and vanish there, or at some distance from his limb. 2. Their apparent velocities are always greatest over the middle of the disk, and gradually slower from thence on each side towards the limb. 3. The shape of the spots varies according to their position on the several parts of the disk: those which are round and broad in the middle, grow oblong and slender as they approach the limb, according as they ought to appear by the rules of optics.

By comparing many observations of the intervals of time in which the spots made their revolution, by Galileo, Cassini, Scheiner, Hevelius, Dr. Halley, Dr. Derham, and others, it is found that 27 days, 12 hours, 20 minutes, is the measure of one of them at a mean; but in this time the earth describes the angular motion of 26° 22′, about the sun's center: therefore say, as the angular motion of 360° + 26° 22′, is to 360°; so is 27 days, 12 hours, 20 minutes, to 25 days, 15 hours, 16 minutes; which, therefore, is the time of the sun's revolution about its axis.

Had the spots moved over the sun in right lined directions, it would have shewn the sun's axis to have been perpendicular to the plane of the ecliptic, but since they move in a curvilinear path, it proves his axis inclined to the axis of the ecliptic, and it is found by observation, that the angle is equal to 7° 30′; that is, if B D (plate CLXV, fig. 2.) passing through the center of the sun C, be perpendicular to the plane of the earth's equator H I, then will the axis of the sun's motion, A E, contain, with that perpendicular, the angle A C B, = 7° 30′ = G C I, the angle which the equator of the sun G F makes with the plane of the ecliptic: and the points in which a plane, passing through the perpendicular B D and axis A E, cuts the ecliptic are in the eighth degree of pisces, on the side next the sun's north pole A, and consequently in the eighth degree of virgo, on the other side next the sun's south pole E. Scheiner had determined the angle B C A to be 7°, and Cassini made it eight by his observations, which is the reason why 7°, 30′, is chosen for a mean.

As to the magnitude of the spots, they are very considerable, as will appear if we observe that some of them are so large as to be plainly visible to the naked eye: thus Galileo saw one of them in the year 1612; and Mr. Martin assures us, that he knew two gentlemen that thus viewed them within a few years past: whence he concludes, that these spots must therefore subtend, at least, an angle of one minute. Now the diameter of the earth, if removed to the sun, would subtend an angle of but 20″; so that the diameter of a spot, just visible to the naked eye, is, to the diameter of the earth, as 60 to 20, or as 3 to 1; and, therefore, the surface of the spot, if circular, to a great circle of the earth, is as 9 to 1: but 4 great circles are equal to the earth's superficies; whence the surface of the spot is, to the surface of the earth, as 9 to 4; or as $2\frac{1}{4}$ to 1. Gassendus says, he saw a spot whose diameter was equal to $\frac{1}{20}$ of that of the sun, and therefore subtended an angle at the eye of 1′ 30″; its surface was therefore 5 times larger than the surface of the whole earth.

What these spots are, it is presumed, nobody can tell; but they seem to be rather thin substances than solid bodies, because they lose the appearance of solidity in going off the disk of the sun: they resemble something of the nature of scum or scoria, swimming on the surface, which are generated and dissolved by causes little known to us: but whatever these solar spots are, it is certain they are produced from causes very inconstant and irregular; for Scheiner says he frequently saw fifty at once, but for twenty years after scarce any appeared. And in this century the spots were very frequent and numerous till the year 1741, when, for three years successively, very few appeared; and now, since the year 1744, they have again appeared as usual.

These

These maculæ are not peculiar to the sun, they have been observed in all the planets. Thus venus was observed to have several by signior Blanchini, in the year 1726. As in venus, so in mars both dark and bright spots have been observed, first by Galileo, and afterwards by Cassini, *&c.* Jupiter has had his spots observable ever since the invention and use of large telescopes. Saturn, by reason of his great distance on one hand, and mercury, by reason of his smalness and vicinity to the sun on the other, have not as yet had any spots discovered on their surfaces, and consequently nothing in relation to their diurnal motions and inclinations of their axis to the planes of their orbits can be known, which circumstances are determined in all the other planets, as well as in the sun, by means of these maculæ. See the articles VENUS, MARS, and JUPITER.

The spots, or maculæ, observable on the moon's surface, seem to be only cavities or large caverns on which the sun shining very obliquely, and touching only their upper edge with his light, the deeper places remain without light; but as the sun rises higher upon them, they receive more light, and the shadow, or dark parts, grow smaller and shorter, till the sun comes at last to shine directly upon them, and then the whole cavity will be illustrated: but the dark, dusky spots, which continue always the same, are supposed to proceed from a kind of matter or soil, which reflects less light than that of the other regions. See MOON.

MAD-APPLE, a name given by some to the solanum. See the article SOLANUM.

MAD-WORT, *alysson*, in botany. See the article ALYSSON.

MADAGASCAR, or *St.* LAURENCE, an island of Africa, situated between 43° and 51° of east longitude, and between 12° and 26° south latitude; three hundred miles south-east of the continent of Africa. It is about a thousand miles in length from north to south, and generally between two and three hundred miles broad. The country is divided among a great number of petty sovereigns.

MADDER, in commerce, is the root of the rubia-plant, for the characters of which, see the article RUBIA.

It is one of the long and small roots, distinguishable from all others by its remarkable red colour, and firm texture; its surface is wrinkled, and in the thickest part it seldom exceeds the bigness of a goose-quill. It has very little smell; but it has a remarkable taste, it being a mixture of sweet and bitter, together with a manifest astringency.

Madder is cultivated in vast quantities in several parts of Holland; the Dutch supply all Europe with it, and make a great advantage by trading in it. What they send over, for the use of the dyers, is ground into a coarse powder, of which there are two kinds: the one is the whole root ground, and the other is that which is first cleaned from the cortical part, and then ground to a powder; this last is of a paler and more agreeable colour.

This root is an attenuant, and has the credit of being a vulnerary of the first rank. It is given in chronic cases, where there are obstructions of the viscera. It promotes the menses and urine; and is good in jaundices, dropsies, and obstructions of the spleen. Its dose is from five grains to fifteen; but it is seldom given singly. It frequently makes an ingredient in infusions and decoctions, among medicines of the same intention, and gives them an elegant colour.

It is used in great quantities by the dyers, for dying red and other colours: and may be made into a lake, in the same manner as brasil. See *Artificial* LACCA.

MADERAS, some islands situated in the Atlantic ocean, three hundred miles west of Sallee, in Africa, in 16° west longit. and between 32° and 33° of north lat. The largest of them, called Madera, or rather Mattera, by the Portuguese, is about an hundred and twenty miles in circumference, and produces incredible quantities of wine, which has the peculiar quality of keeping best in hot climates, where other wines turn sour.

MADNESS, *mania*, a most dreadful kind of delirium, without a fever.

Melancholy and madness may very justly be considered as diseases nearly allied; for they have both the same origin, that is, an excessive congestion of blood in the brain: they only differ in degree, and with respect to the time of invasion; melancholy being the primary disease, of which madness is the augmentation. Both these disorders suppose a weakness of the brain, which may proceed from an hereditary disposition; from violent disorders of the mind, especially long continued grief, sadness, anxiety, dread, and terror; from close study and intense application of mind to one subject; from narcotic and stupefying medicines; from pre-

vious diseases, especially acute fevers; from a suppression of hæmorrhages, and omitting customary bleeding; from excessive cold, especially of the lower parts, which forces the blood to the lungs, heart, and brain; and from violent anger, which will change melancholy into madness.

It is evident from observation, that the blood of maniac patients is black, and hotter than in the natural state; that the serum separates more slowly and in a less quantity than in healthy persons; and that the excrements are hard, of a dark red or greyish colour, and the urine light and thin.

The antecedent signs of madness are a redness and suffusion of the eyes with blood, a tremulous and inconstant vibration of the eye-lids, a change of disposition and behaviour; supercilious looks, a haughty carriage, disdainful expressions, a grinding of the teeth, and unaccountable malice to particular persons: also little sleep, a violent head-ach, quickness of hearing, incredible strength, insensibility of cold; and, in women, an accumulation of blood in the breasts, in the increase of this disorder.

Diseases of the mind have something in them so different from other disorders, that they sometimes remit for a long time, but return at certain periods, especially about the solstices. It may likewise be observed, that the raving fits of mad people, which keep the lunar periods, are generally accompanied with epileptic symptoms.

This disease, when it is primary or idiopathic, is worse than the symptomatic, that accompanies the hysteric or hypochondriac passion, which is easily cured; as is that also which succeeds intermitting fevers, a suppression of the menses, of the lochia, of the hæmorrhoids, or which is occasioned by narcotics. When the paroxysms are slight in the idiopathic kind, the cure is not very difficult; but if it is inveterate, and has but short remissions, it is almost incurable. Sometimes this disease terminates by critical excretions of blood from the nose, uterus, or anus: sometimes diarrhœas and dysenteries will terminate these disorders; and pustules, ulcers, and the itch have also done the same. As to the cure, bleeding is the most efficacious of all remedies; and where there is a redundance of thick grumous blood, a vein is to be first opened in the foot, a few days after in the arm; then in the jugular vein, or one in the nostrils with a straw; and last of all the frontal veins, with a blunt-lancet, for fear of hurting the pericranium. Tepid baths made of rain or river-water are also convenient; and before the patient enters the bath, he should have cold water poured on his head. Purgatives are likewise useful; but the lenient are to be preferred to the drastic: thus manna, cassia, rhubarb, cream of tartar, or tartar vitriolate, are most convenient, when the disease arises from the hypochondriac passion, a stagnation of the blood in the intestines, or in the ramification of the vena portæ, especially when taken in decoctions and infusions at repeated intervals, so as to operate in an alterative manner. Some kinds of mineral waters are also highly efficacious in melancholy and madness: but nothing is better for removing the cause of these disorders, than depurated mercury. Particular medicines among vegetables, are baum, betony, vervain, brook-lime, sage, wormwood, flowers of St. John's wort, of the lime tree, and camphire: from animals, ass's blood: among minerals, steel, cinnabar, sugar of lead, and the calx and tincture of silver. Hoffman is of opinion, that nothing better deserves the name of a specific in these diseases than motion and exercise, when duly proportioned to the strength of the body. Sedative medicines are good, but not opiates and narcotics, for these induce stupidity and folly: those that are good in an epilepsy, will be here beneficial, such as castor, shavings of hart's horn, the roots and seeds of piony; antiepileptic powders, the valerian-root, flowers of the lily of the valley and of the lime-tree. Boerhaave says, the principal remedy for raving madness, is dipping in the sea, and keeping the patient there as long as he can bear it. As a high degree of the itch has terminated these disorders, it may be proper to make issues in the back: but blisters (contrary to Shaw's opinion) are prejudicial; for by stimulating the nervous membranes and the dura mater, they increase the spasmodic stricture, and the motion of the gross and bilious blood through the head and the other parts of the body.

As to diet, the patient should carefully abstain from salt and smoked flesh, whether beef or pork; from shell-fish; from fish of a heavy and noxious quality; from aliments prepared with onions and garlic: all which generate a thick blood. He should, in general, eat no more than

is fufficient to fupport nature. Small beer, or cold pure water, are the beft drink; but fweet and ftrong wines are highly prejudicial, as is alfo exceffive fmoaking tobacco. Change of air and travelling may be beneficial.

For the madnefs proceeding from the bite of a mad dog, fee HYDROPHOBIA.

MADRAS, a town on the coaft of Cormandel, inhabited by blacks, and fituated juft without the walls of the Whitetown of Fort St. George. This town has been furrounded by a ftone wall by governor Pitt.

MADRE DE POPA, a town and convent of Terra Firma, in South America, fituated on the river Grande, fifty miles eaft of Carthagena, almoft as much reforted to by the pilgrims of America, as the chapel of Loretto is by the pilgrims of Europe: weft long. 76°, north lat. 11°.

MADREPORA, in botany, a genus of fubmarine plants, of a ftony hardnefs, but fomewhat approaching to the form of other vegetables. It is compofed of a main ftem, and fubdivided into a number of branches, which are full of holes or pores, in a radiated form. See plate CLXX. fig. 1.

MADRID, the capital of the province of New Caftile, and of the whole kingdom of Spain: weft long. 4° 15′, and north lat. 40° 30′.

It is fituated almoft in the middle of a large fandy plain, furrounded with high mountains: it is about feven miles in circumference, and contains feveral grand ftreets and fpacious fquares; it has alfo three royal palaces, called the Palace Royal, the Cafo del Campo, and the Buen Retiro.

MADRIER, in the military art, a long and broad plank of wood, ufed for fupporting the earth in mining and carrying on a fap, and in making coffers, caponiers, galleries, and for many other ufes at a fiege. Madriers are alfo ufed to cover the mouths of petards, after they are loaded, and are fixed with the petards to the gates or other places defigned to be forced open.

MADRIGAL, in the italian, fpanifh, and french poetry, is a fhort amorous poem, compofed of a number of free and unequal verfes, neither confined to the regularity of a fonnet, nor to the point of an epigram, but only confifting of fome tender and delicate thought, expreffed with a beautiful, noble, and elegant fimplicity. The madrigal is ufually confidered as the fhorteft of all the leffer kinds of poetry, except the epigram: it will admit of fewer verfes than either the fonnet or the roundelay; no other rule is regarded in mingling the rhimes, and the different kinds of verfe, but the fancy and convenience of the author: however this poem allows of lefs licence than many others, both with refpect to rhime, meafure, and delicacy of expreffion.

MADRIGAL, in geography, a city of the province of Popayan, in South America: weft long. 75° 30′, and north lat. 30′.

MADURA, the capital of a province of the fame name in the hither India: eaft long. 77°, and north lat. 10°.

MÆMACTERION, μαιμακτηριων, in antient chronology, the fourth month of the athenian year, confifting of only twenty-nine days, and anfwering to the latter part of September and the beginning of October.

MÆNA, in ichthyology, the variegated fparus, with a black fpot in the middle of the fide, and with four large teeth. See the article SPARUS.

MAES, a river which arifes in Burgundy, and runs through Lorrain and Champaign into the Netherlands, and at laft, after paffing by many confiderable towns, difcharges itfelf into the German fea, a little below the Briel.

MAESTRICHT, a town in the province of Brabant, fituated on the river Maes, thirteen miles north of Liege: eaft long. 5° 40′, and north lat. 50° 55′.

MAESYCK, a town of Germany, in the bifhopric of Liege, fixteen miles north-eaft of Maeftricht.

MAGADOXA, the capital of the territory of the fame name, at the mouth of the river Magadoxa, on the coaft of Anian, in Africa: eaft longit. 41°, and north lat. 2°.

MAGAS, in antient mufic, the name of two inftruments, the one a ftringed kind, and the other a kind of flute, which is faid to have yielded very high and very low founds at the fame time.

Magas alfo fignifies the bridge of any inftrument.

MAGAZINE, a place in which ftores are kept, of arms, ammunition, provifions, &c. Every fortified town ought to be furnifhed with a large magazine, which fhould contain ftores of all kinds, fufficient to enable the garrifon and inhabitants to hold out a long fiege, and in which fmiths, carpenters, wheelwrights, &c. may be employed, in making every

thing

thing belonging to the artillery, as carriages, waggons, &c.

MAGDALEN, or *Nuns of St.* MAGDALEN, an order of religious in the romish church, dedicated to St. Mary Magdalen, and sometimes called magdalenettes. These chiefly consist of courtezans, who quitting their profession, devote the rest of their lives to repentance and mortification.

MAGDEBURG, the capital of the dutchy of the same name, situated on the river Elbe, seventy miles west of Berlin: east long. 12°, and north. lat. 52° 15′.

MAGDELENA, a large river of South America, which, rising near the equator, runs north thro' Terra Firma, and uniting its waters with the river Cance, obtains the name of the river Grande, and falls into the north sea, below the town of Madre de Popa.

MAGELLAN STREIGHTS, or rather *Streights of* MAGELLAN. These streights are about three hundred miles in length from the Atlantic to the Pacific ocean, but of a very unequal breadth; and were at first discovered and passed by Ferdinand Magellan, from whom they had their name: they are situated between the island Terra del Fuego and the most southern part of the continent of America, between 76° and 84° of west longitude, and between 52° and 54° of south lat.

Lake of MAGGIORE, is situated partly in the dutchy of Milan, and partly in the country of the Grisons: this lake is thirty-five miles long, and six broad.

MAGI, or MAGIANS, an antient religious sect in Persia, and other eastern countries, who maintained, that there were two principles, the one the cause of all good, the other the cause of all evil; and abominating the adoration of images, worshipped God only by fire, which they looked upon as the brightest and most glorious symbol of Oromasdes, or the good God; as darkness is the truest symbol of Arimanius, or the evil god. This religion was reformed by Zoroaster, who maintained that there was one supreme independent being; and under him two principles or angels, one the angel of goodness and light, and the other of evil and darkness: that there is a perpetual struggle between them, which shall last to the end of the world; that then the angel of darkness and his disciples shall go into a world of their own, where they shall be punished in everlasting darkness; and the angel of light and his disciples shall also go into a world of their own, where they shall be rewarded in everlasting light. See the article ZEND.

The priests of the magi were the most skilful mathematicians and philosophers of the ages in which they lived, insomuch that a learned man and a magian became equivalent terms. The vulgar looked on their knowledge as more than natural, and imagined them inspired by some supernatural power: and hence those who practised wicked and mischievous arts, taking upon themselves the name of magians, drew on it that ill signification which the word magician now bears among us.

This sect still subsists in Persia, under the denomination of gaurs, where they watch the sacred fire with the greatest care, and never suffer it to be extinguished. See the article GAURS.

MAGIC, originally signified only the knowledge of the more sublime parts of philosophy; but as the magi likewise professed astrology, divination, and sorcery, the term magi became odious, being used to signify an unlawful diabolical kind of science, acquired by the assistance of the devil and departed souls. See the articles ASTROLOGY, DIVINATION, NECROMANCY, &c.

Natural magic is only the application of natural philosophy to the production of surprising but yet natural effects. The common natural magic, found in books, gives us only some childish and superstitious traditions of the sympathies and antipathies of things, or of their occult and peculiar properties; which are usually intermixed with many trifling experiments, admired rather for their disguise than for themselves. See the article EXPERIMENTAL PHILOSOPHY.

MAGIC LANTERN, in optics. See the article LANTERN.

MAGIC SQUARE, in arithmetic, a square figure made up of numbers in arithmetical proportion, so disposed in parallel and equal ranks, that the sums of each row, taken either perpendicularly, horizontally, or diagonally, are equal: thus,

Natural square.

1	2	3
4	5	6
7	8	9

Magic square.

2	7	6
9	5	1
4	3	8

Magic squares seem to have been so called, from their being used in the construction of talismans.

MAGISTERY, in chemistry, a very fine powder

powder made by solution and precipitation. Of these there are three kinds mentioned by Quincy, the magistery of antimony, of bismuth, and of calamine. 1. The magistery of antimony is made thus: take of antimony, in very fine powder, four ounces; put it into a large matrass, pour upon it one pound of aqua regia, by four ounces at a time; set it upon a sand-heat, in a chimney, that the fumes may ascend without offence: let it stand in a heat of digestion ten or twelve hours, shaking it once in two or three hours; then let it cool, and put to it a gallon of spring-water, which pour off before it settles; put to it more water, stir it, and pour it to the other before it settles: repeat this operation till nothing remains in the matrass but a yellow powder, which is the combustible sulphur of antimony: let the white powder settle, and decant the water, till by several ablutions the magistery becomes insipid: then dry, and keep it for use. This is given in apoplexies, palsies, and all nervous and hypochondriacal distempers: its dose is from five to fifteen grains.
2. Magistery of bismuth is made thus; take spirit of nitre, one pound; and add to it as much powder of bismuth as it is capable of dissolving; then dissolve four ounces of common salt in two gallons of water; filter it, and pour into it the dissolution of bismuth, when it will turn milky, and let fall a precipitate: when it is settled, pour off the water from the magistery; add more fresh water, and continue the ablutions till the magistery becomes insipid; then dry it gently for use. 3. Magistery of calamine is thus made: take calamine, in fine powder, four ounces; put it into a matrass, and pour upon it spirit of salt, one pound; let them digest upon warm sand, forty-eight hours; filter the dissolution, and precipitate the magistery with spirit of urine; free it from its salt by several ablutions, and dry it gently for use.

MAGISTRATE, any public officer to whom the executive power of the law is committed, either wholly, or in part.

MAGNA ASSISA ELIGENDA, is a writ antiently directed to the sheriff for summoning four lawful knights before the justices of assise, in order to choose twelve knights of the neighbourhood, *&c.* to pass upon the great assise between such a person plaintiff, and such a one defendant.

MAGNA CHARTA, the great charter of the liberties of England, and the basis of our laws and privileges.

This charter may be said to derive its origin from king Edward the Confessor, who granted several privileges to the church and state, by charter: these liberties and privileges were also granted and confirmed by king Henry I. by a celebrated great charter, now lost; but which was confirmed or re-enacted by king Henry II. and king John. Henry III, the successor of this last prince, after having caused twelve men to make enquiry into the liberties of England in the reign of Hen. I. granted a new charter, which was the same as the present magna charta; this he several times confirmed, and as often broke; till in the thirty-seventh year of his reign, he went to Westminster-hall, and there, in the presence of the nobility and bishops, who held lighted candles in their hands, magna charta was read, the king all the while holding his hand to his breast, and at last solemnly swearing faithfully and inviolably to observe all the things therein contained, *&c.* then the bishops extinguishing the candles, and throwing them on the ground, they all cried out, "Thus let him be extinguished, and stink in hell, who violates this charter." It is observed, that notwithstanding the solemnity of this confirmation, king Henry, the very next year, again invaded the rights of his people, till the barons entered into a war against him, when, after various success, he confirmed this charter, and the charter of the forest, in the fifty-second year of his reign. This excellent charter, so equitable and beneficial to the subject, is the antientest written law in the kingdom: by the 25 Edw. I. it is ordained, that it shall be taken as the common law; and by the 43 Edward III. all statutes made against it are declared to be void.

MAGNES ARSENICALIS, ARSENICAL MAGNET. See the article ARSENIC.

MAGNESIA, MANGANESE, in natural history. See the article MANGANESE.

MAGNET, or LOADSTONE, *magnes*, in natural history, a very rich iron ore, found in large detached masses, of a dusky iron-grey, often tinged with brownish or reddish, and when broken appearing something like the common emery, but less sparkling. It is very heavy, considerably hard, of a perfectly irregular and uneven surface, and of a firm structure, but usually with some porous

porous irregularities within. It is found in England, and all other places where there are iron mines.

The primary properties of the loadſtone are the following: 1. Every loadſtone has two points, called poles, which emit the magnetic virtue. 2. One of theſe poles attracts, the other repels iron, but no other body. 3. This virtue, being the third ſpecies of attraction, is communicated to iron very copiouſly by the touch, which renders it ſtrongly magnetic. 4. A piece of iron ſo touched by the loadſtone, and nicely ſuſpended on a ſharp point, will be determined to ſettle itſelf in a direction nearly north and ſouth. 5. The end of the needle touched by the ſouth pole of the ſtone, will point northwards; and the contrary. 6. Needles touched by the ſtone, will dip below the horizon, or be directed on the touched part to a point within the earth's ſurface: this is called the dipping needle. 7. This virtue may alſo be communicated to iron by a ſtrong attrition all one way. 8. Iron-rods or bars acquire a magnetic virtue by ſtanding long in one poſition. 9. Fire totally deſtroys this virtue, by making the ſtone or iron red-hot. 10. This power is exerted ſenſibly to the diſtance of ſeveral feet. 11. It is ſenſibly continued through the ſubſtance of ſeveral contiguous bodies or pieces of iron. 12. It pervades the pores of the hardeſt body. And, 13. Equally attracts the iron in vacuo as in open air. Theſe and many more are the properties of a body, not more wonderful than uſeful to mankind. See POLE, NEEDLE, VARIATION, &c.

There is a very curious method of rendering viſible the directions which the magnetic effluvia take in going out of the ſtone: thus, let AB, CD, (pl. CLXV. fig. 5.) be the poles of the ſtone; about every ſide gently ſtrew ſome ſteel-filings on a ſheet of white paper; theſe ſmall particles will be affected by the effluvia of the ſtone, and ſo poſited as to ſhew the courſe and direction of the magnetic particles on every part: thus, in the middle of each pole, between AB and CD, it appears to go nearly ſtraight on; towards the ſides it proceeds in lines more and more curved, till at laſt the curved lines from both poles meeting and coinciding, form numberleſs curves on each ſide, nearly of a circular figure, as repreſented in the diagram. This ſeems to ſhew that the magnetic virtue emitted from each pole, circulates to, and enters the other. The law of magnetic attraction ſeems not yet aſcertained. Sir Iſaac Newton ſuppoſes it to decreaſe nearly in the triplicate ratio of the diſtance; but Dr. Helſham trying the experiment with his loadſtone, found it to be as the ſquares of the diſtances inverſely; and Mr. Martin aſſures us, that the power of his loadſtone decreaſes in a different manner from either, it being in the ſeſquiplicate ratio of the diſtances inverſely. For exactneſs, he made a ſquare bar of iron juſt a quarter of an inch thick, and then provided three pieces of wood of the ſame form and thickneſs exactly; then poiſing the loadſtone very nicely at the end of a balance, which would turn with leſs than a grain, he placed under it the iron, with firſt one piece of wood, then two pieces, and laſtly all three pieces upon it; by which means the ſteel-points of the pole were kept at $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, of an inch from the iron; and in thoſe diſtances the weights put into the oppoſite ſcale, to raiſe the loadſtone from the wood (which is touched while the beam was horizontal) were as follows.

Diſt.	Grains.	Ratio of the ſq.	Ratio of the cubes.	Seſquip. ratio.
$\frac{1}{4}$	156	156	156	156
$\frac{1}{2}$	58	39	19	56
$\frac{3}{4}$	28	17	6	30

Whence it appears that the number of grains to counteract the power of the loadſtone in theſe diſtances; approach very near, and are almoſt the ſame with thoſe which are in the ſeſquiplicate ratio, but are widely different from thoſe which are in the duplicate or triplicate ratio; and this experiment Mr. Martin tried ſeveral times for each diſtance, with ſcarce any variation in the ſucceſs.

The ingenious Muſchenbroek has, with indefatigable pains and application, made experiments of the attractions and repulſions of loadſtones in reſpect to iron and to each other, but could never find any regular proportion in the increaſe of attraction in their approach to, or decreaſe of attraction in their receſs from one another; only that the force of the magnetic virtue did increaſe in the approach to, and diminiſh in the receſs from the ſtone, but not exactly as the diſtance, nor as the ſquare or cube of the diſtance, nor as the ſquare or cube of the diſtance reciprocally; nor in any proportion reducible to numbers; and therefore he very reaſonably conjectures, that the repulſions and

and attractions disturb one another, so as to confound the proportion: nor are we able to hope for any other rule concerning this matter, till a way be found, if ever it can be, of separating the attracting from the repelling parts.

The power or force of magnets is generally greater in small than in large ones, in proportion to their bulk. It is very rare that very large ones will take up more than three or four times their own weight, but a small one is but tolerably good that will take up no more than eight, ten, or twelve times its weight. The honourable Mr. Berkeley has one whose weight is but 43 grains, which will take up 1032 grains, which is 24 times its weight; but that of Mr. Newton, which he wears in his ring, weighing scarcely three grains, will take up 746 grains, or 250 times its weight.

The poles of a loadstone are not to be looked upon as two such invariable points as never to change place; for according to Mr. Boyle, the poles of a little bit of magnet may be changed by applying them to the more vigorous poles of another, as has been confirmed by Dr. Knight, who could change at pleasure the poles of a natural magnet, by means of iron-bars magnetically impregnated. Upon gently cutting a magnet through the middle of its axis, each piece becomes a complete magnet; for the parts that were contiguous under the equator before the magnet was cut, become poles, and even poles of different names; so that each piece may become equally a north or south pole, according as the section was made nearer the south or north pole of the large magnet; and the same thing would happen in any other sub-divisions. But upon cutting a magnet longitudinally, there will then be four poles, the same as before the cutting; only that there shall be formed in each piece a new axis parallel to the former, and more or less in the inside of the magnet. We find by experience, that two magnets attract each other by the poles of different denominations; whereas, on the contrary, the two similar poles repel each other. The attraction of a magnet newly dug out of a mine, makes it take up only very small pieces of iron; for which reason it must be armed, in order to augment its force: besides this, the arming it unites, directs, and condenses its virtue towards its poles, and causes its emanations to tend entirely towards the mass which is laid thereon.

When you have determined where the poles are, which you may exactly find by placing over the magnet a very fine short needle, which will stand perpendicular over each pole, and no where else; then you must file it very smooth at its poles, so that the axis shall have the greatest length, yet without too much diminishing its other dimensions. To determine the proportions of the armour, the greater the force of the magnet is, the thicker must the pieces of steel be of which it is to consist; and for this purpose try the magnet with several steel-bars, and the greater weight it takes up with a steel-bar on, that bar is to be its armour. Though the attraction of an armed magnet appears considerable, yet very weak causes destroy its effect in a moment; for instance, when an oblong piece of iron is attracted under the pole of an excellent magnet, and the pole of a different denomination in another magnet that is weaker is presented to the lower end of this piece of iron, this weaker magnet will very strongly take away the iron. In like manner, if the point of a needle be put under one of the poles of a magnet so as to hang by its head, and present to this head any bar of iron by its upper end, the needle will immediately quit the magnet, in order to adhere to the bar; but if the needle hold by its head to the pole of the magnet, then neither the bar of iron nor a weak magnet shall disengage it; and there is another slight circumstance which makes an armed and vigorous loadstone appear to have no more force, and that is the too great length of the iron which is to be raised by one of the poles.

In order to communicate the magnetic virtue effectually, these methods are made use of. 1. It has been discovered, that iron rubbed upon one of the poles of the magnet, acquires a great deal more virtue than from any other part thereof, and this is more considerable from an armed than a naked magnet. 2. The more gently the iron is pressed, and the more it is pressed against the pole, the more magnetical it becomes. 3. It is more convenient to impregnate iron on one pole than on both successively. 4. The iron is much better impregnated by pressing it uniformly and in the same direction, according to its length, than by rubbing it by the middle; and the extremity

mity which touches the pole laſt, retains the moſt virtue. 5. A piece of poliſhed ſteel, or a bit of pointed iron, receives more virtue than a ſimple piece of iron of the ſame figure; and, *cæteris paribus*, a piece of iron that is long, ſmall, and pointed, is more ſtrongly impregnated than that of any other form.

The communication of the magnetic virtue, does not ſenſibly impair that of the loadſtone; though it has been obſerved, that ſome magnets have communicated a greater power to iron to raiſe weights, than they had themſelves, but without impairing their own force, or adding any thing to the weight of the iron.

As ſeveral ways have been propoſed for recovering the decayed virtue of loadſtones, but to little purpoſe (eſpecially that of keeping the ſtone conſtantly in ſteel-filings) we ſhall here relate the remarkable experiment of Mr. Haac for this purpoſe, as it was attended with great ſucceſs. This gentleman had a magnet weighing fourteen ounces and a half, armed, which would take up ſixteen times its own weight; but having laid it by for ſome years unuſed, it loſt one fourth part of its virtue, or more; whereupon he hung as much weight to the ſtone as it would ſuſtain, and ſo left it for ſome weeks; then returning, he applied more weight to the former, which it very eaſily bore, and then repeating the addition of more weight at ſeveral periods, in the ſpace of about two years, he found that the ſtone had not only recovered its former ſtrength, but increaſed it ſo far as that it would now take up more than twenty pounds, whereas at firſt it would not take up fifteen.

Artificial MAGNET, a ſteel-bar impregnated with the virtues of the magnet, ſo as to poſſeſs all the properties, and be uſed inſtead of the natural loadſtone.

There have been ſeveral methods propoſed for making artificial magnets, but none has yet met with greater ſucceſs than that of Mr. Canton, which is as follows: procure a dozen of bars, ſix of ſoft ſteel, each three inches long, one quarter of an inch broad, and one twentieth of an inch thick; with two pieces of iron, each half the length of one of the bars, but of the ſame breadth and thickneſs: alſo ſix pieces of hard ſteel, each five inches and a half long, half an inch broad, and three twentieths of an inch thick; with two pieces of iron of half the length, but the whole breadth and thickneſs of one of the hard bars: and let all the bars be marked with a line quite round them at one end. Then take an iron-poker and tongs, (plate CLXVI. fig. 1.) (or two bars of iron) the larger they are, and the longer they have been uſed, the better; and fixing the poker upright between the knees, hold to it, near the top, one of the ſoft bars, having its marked end downwards, by a piece of ſewing ſilk, which muſt be pulled tight by the left hand, that the bar may not ſlide: then graſping the tongs with the right hand, a little below the middle, and holding them nearly in a vertical poſition, let the bar be ſtroked, by the lower end from the bottom to the top, about ten times on each ſide, which will give it a magnetic power ſufficient to lift a ſmall key at the marked end; which end, if the bar was ſuſpended on a point, would turn towards the north, and is therefore called the north pole, and the unmarked end is for the ſame reaſon called the ſouth pole. Four of the ſoft bars being impregnated after this manner, lay the other two (*ibid.* fig. 2.) parallel to each other, at the diſtance of one fourth of an inch, between the two pieces of iron belonging to them, a north and a ſouth pole againſt each piece of iron; then take two of the four bars already made magnetical, and place them together ſo as to make a double bar in thickneſs, the north pole of one even with the ſouth pole of the other, and the remaining two being put to theſe, one on each ſide, ſo as to have two north and two ſouth poles together, ſeparate the north from the ſouth poles at one end by a large pin, and place them perpendicularly with that end downward on the middle of one of the parallel bars, the two north poles towards its ſouth, and the two ſouth poles towards its north end: ſlide them backward and forward three or four times the whole length of the bar, and removing them from the middle of this, place them on the middle of the other bar as before directed, and go over that in the ſame manner; then turn both the bars the other ſide upwards, and repeat the former operation: this being done, take the two from between the pieces of iron, and placing the two outermoſt of the touching bars in their room, let the other two be the outermoſt of the four to touch theſe with; and this proceſs being repeated till each pair of bars have been touched three or four times over,

over, which will give them a confiderable magnetic power, put the half dozen together after the manner of the four, (*ibid.* fig. 3.) and touch with them two pair of the hard bars placed between their irons, at the diftance of about half an inch from each other; then lay the foft bars afide, and with the four hard ones, let the other two be impregnated, (*ibid.* fig. 4.) holding the touching bars apart at the lower end near two tenths of an inch, to which diftance let them be feparated after they are fet on the parallel bar, and brought together again before they are taken off; this being obferved, proceed according to the method defcribed above, till each pair have been touched two or three times over: but as this vertical way of touching a bar will not give it quite fo much of the magnetic virtue as it will receive, let each pair be now touched once or twice over in their parallel pofition between the irons (*ibid.* fig. 5.) with two of the bars held horizontally, or nearly fo, by drawing at the fame time the north of one from the middle over the fouth end, and the fouth of the other from the middle over the north end of a parallel bar; then bringing them to the middle again, without touching the parallel bar, give three or four of thefe horizontal ftrokes to each fide. The horizontal touch after the vertical, will make the bars as ftrong as they poffibly can be made, as appears by their not receiving any additional ftrength, when the vertical touch is given by a great number of bars, and the horizontal by thofe of a fuperior magnetic power. This whole procefs may be gone through in about half an hour; and each of the large bars, if well hardened, may be made to lift twenty-eight troy ounces, and fometimes more. And when thefe bars are thus impregnated, they will give to an hard bar of the fame fize its full virtue in lefs than two minutes; and therefore will anfwer all the purpofes of magnetifm in navigation and experimental philofophy much better than the loadftone, which is known not to have a fufficient power to impregnate hard bars. The half dozen being put into a cafe (*ibid.* fig. 6.) in fuch a manner as that two poles of the fame denomination may not be together, and their irons with them as one bar, they will retain the virtues they have received: but if their power fhould, by making experiments, be ever fo far impaired, it may be reftored without any foreign affiftance in a few minutes. And if, out of curiofity, a much larger fet of bars fhould be required, thefe will communicate to them a fufficient power to proceed with, and they may in a fhort time, by the fame method, be brought to their full ftrength.

MAGNIFYING, in philofophy, the making of objects appear larger than they would otherwife do; whence convex lenfes, which have the power of doing this, are called magnifying glaffes; and of fuch glaffes are microfcopes conftructed. See LENS and MICROSCOPE.

MAGNITUDE, whatever is made up of parts locally extended, or that hath feveral dimenfions; as a line, furface, folid, &c. See the article LINE, &c.

The apparent magnitude of a body is that meafured by the vifual angle, formed by rays drawn from its extremes to the center of the eye; fo that whatever things are feen under the fame or equal angles, appear equal; and, *vice verfa.* Mr. Mac Laurin obferves, that geometrical magnitudes may be ufefully confidered as generated or produced by motion. Thus, lines may be conceived as generated by the motion of points; furfaces, by the motion of lines; folids, by the motion of furfaces; angles may be fuppofed to be generated by the rotation of their fides. Geometrical magnitude is always underftood to confift of parts; and to have no parts, or to have no magnitude, are confidered as equivalent in this fcience. There is, however, no neceffity for confidering magnitude as made up of an infinite number of fmall parts; it is fufficient that no quantity can be fuppofed to be fo fmall, but it may be conceived to be farther diminifhed; and it is obvious, that we are not to eftimate the number of parts that may be conceived in a given magnitude, by thofe which, in particular determinate circumftances, may be actually perceived in it by fenfe, fince a greater number of parts become fenfible, by varying the circumftances in which it is perceived.

For the different magnitudes of the fixed ftars, fee the article STAR.

MAGNOLIA, the LAUREL-LEAVED TULIP TREE, in botany, a genus of the polyandria-polygamia clafs of plants; the corolla of which confifts of nine oblong, hollow, and obtufe petals, narroweft toward the bafe: the fruit is an oval ftrobilus, compofed of compreffed, roundifh, acute, and cluftered capfules, which are

unilocular, and contain a fingle kidney-fhaped feed.

Could this beautiful tree be fo far naturalized as to endure the cold of our fevere winters, it would make one of the greateft ornaments of our gardens. It is propagated by feeds, which fhould be procured from Carolina.

MAGPY, in ornithology, a fpecies of corvus, with a cuneiform tail. See the article CORVUS.

* This is a very well known bird, and when in full feather, and in its wild ftate, has a great deal of beauty; the fize is about that of the jack daw; but its variegated wings and length of tail make it feem longer.

MAHOMETANS, thofe who believe and practife the religion of Mahomet.

The fundamental pofition on which Mahomet erected the fuperftructure of his religion, was, that there has been from the beginning of the world but one true orthodox belief, which confifts in acknowledging one only true God, and obeying fuch of his meffengers and prophets as he has from time to time fent into the world, to reveal his will to mankind. Upon this foundation he fet up for a prophet to extirpate idolatry, which was the religion of the Arabs, his countrymen, and to reform the other abufes crept into religion. The whole fubftance of his doctrine he therefore comprehended in thefe two principal articles of faith, "There is but one God, and "Mahomet is his prophet;" in confequence of which laft article, all fuch ordinances and inftitutions as he thought fit to eftablifh, were to be received as obligatory and of divine authority.

The mahometans divide their religion into two general parts, faith and practice; of which the firft is divided into fix diftinct branches; belief in God, in his angels, in his fcriptures, in his prophets, in the refurrection and final judgment, and in God's abfolute decrees. The points relating to practice are, prayer, with wafhings, *&c.* alms, fafting, pilgrimage to Mecca, and circumcifion. In regard to thefe practical points, Mahomet, it is faid, declared, that the practice of religion is founded upon cleanlinefs, which is one half of faith and the key of prayer. Alms-giving is thought to be fo pleafing in the fight of God, that the caliph Omar Ebn Abdalaziz ufed to fay, prayer carries us half way to God; fafting brings us to the door of his palace; and alms procure us admiffion: and Mahomet himfelf ufed to fay of fafting, that it was the gate of religion; and the odour of the mouth of him who fafteth is more grateful to God, than that of mufk. Befides thefe they have fome negative precepts and inftitutions of the koran, in which feveral things are prohibited, as ufury, the drinking of wine, all games that depend upon chance, the eating of blood and fwine's flefh, and whatever dies of itfelf, is ftrangled, or is killed by a blow or by another beaft. Thefe doctrines and practices Mahomet eftablifhed by the fword, by preaching, and by the alcoran or koran, which contains the principles of his religion; and he and his followers met with fuch fuccefs, as in a few years to fubdue half the known world. See ALCORAN.

MAIDEN, an inftrument ufed in Scotland for beheading criminals.

This is a broad piece of iron about a foot fquare, very fharp on the lower part, and loaded above with a very heavy weight of lead. At the time of execution it is pulled up to the top of a narrow wooden frame, about ten feet high, and as broad as the engine, with mouldings on each fide for the maiden to flide in. A convenience is made about four feet from the ground, for the prifoner to lay his neck; and there is a kind of bar fo faftened as to keep him from ftirring. The prifoner being thus fecured, and the fign given, the maiden is let loofe, which in a moment feparates his head from his body.

MAIDEN ASSIZE, an affize in which no perfon is condemned to die.

MAIDEN RENTS, was a noble formerly paid in fome manors by a tenant to his lord, for his paffing by the cuftom of marcheta, by which he was to have the firft night's lodging with his tenant's wife: tho' it is thought to fignify a fine paid for a licence to marry a daughter.

MAIDENHEAD, a market-town in Berkfhire, twelve miles north-eaft of Reading.

MAIDSTONE, the county town of Kent, fituated on the Medway, twenty-two miles weft of Canterbury: eaft long. 37′, north lat. 51° 20′. It fends two members to parliament.

MAJESTY, a title given to kings, which frequently ferves as a term of diftinction. Thus the emperor is called facred majefty, imperial majefty, and cæfarian majefty; the king of France is called his moft chriftian majefty, and when he treats with

with the emperor, the word ſacred is added; and the king of Spain is termed his moſt catholic majeſty: with reſpect to other kings, the name of the kingdom is added, as his britannic majeſty, his poliſh majeſty, *&c.* Formerly princes were more ſparing in giving titles, and more modeſt in claiming them; before the reign of Charles V. the kings of Spain had only the title of highneſs; and before that of Henry VIII. the kings of England were only addreſſed under the title of grace and highneſs.

MAIL, or *coat of* MAIL, a piece of defenſive armour for the body, made of ſmall iron rings, interwoven in the manner of a net.

Black MAIL, in our old cuſtoms. See the article ALBA FIRMA.

MAIM, MAIHEM, or MAYHEM, in law, a wound by which a perſon loſes the uſe of a member that might have been a defence to him, as when a bone is broken, a foot, hand, or other member cut off; or an eye put out; though the cutting off an ear or noſe, or breaking the hinder teeth, was formerly held to be no maim. A maim by caſtration was antiently puniſhed with death, and other maims with loſs of member for member: but afterwards they were only puniſhed by fine and impriſonment. It is now enacted, by the ſtatute of 22 and 23 Car. II. that if any perſon from malice aforethought, ſhall diſable any limb or member of any of the king's ſubjects with an intent to disfigure him, the offender, with his aiders and abettors, ſhall be guilty of felony without benefit of clergy; tho' no ſuch attainder ſhall corrupt the blood, or occaſion forfeiture of lands, *&c.*

MAINE, a river of Germany, which riſes on the eaſt ſide of the circle of Franconia, and running from eaſt to weſt, diſcharges itſelf into the Rhine at Mentz.

MAINE is alſo the north-weſt part of the province of Orleanois, in France.

MAINE is alſo a province of New England, bounded by Nova-Scotia, on the north-eaſt; by Maſſachuſets-bay, on the ſouth; and by the province of New Hampſhire, on the ſouth-weſt and north-weſt.

MAINLAND, the chief of the iſlands of Shetland, in the county of the Orcades in Scotland.

MAINPRISE, in law, is the receiving a perſon into friendly cuſtody, who might otherwiſe be committed to priſon, on ſecurity given that he ſhall be forth-coming at a certain time and place appointed. There is a difference between bail and mainpriſe, for a perſon mainpriſed is ſaid to be at large from the day of his being mainpriſed, till the day of his appearance, and is not liable to be confined by his ſureties: but when a perſon is let to bail by a judge, *&c.* till a certain day, he is in law always accounted in the ward of his bail during the time, and they may, if they pleaſe, keep him in priſon.

MAINTENANCE, in law, is an unlawful maintaining or ſupporting a ſuit between others, by ſtirring up quarrels, or interfering in a cauſe in which the perſon has no concern. Thus if any perſon diſintereſted in a cauſe officiouſly gives evidence, or opens the evidence in a ſuit, without being called upon for that purpoſe, or acts the part of counſel, by ſpeaking in the cauſe, or retains an attorney for the party, he is guilty of maintenance, and is liable to be proſecuted by indictment. It is no maintenance, where a perſon gives a poor man money out of charity to carry on a ſuit: and attorneys may lawfully diſburſe their money for their clients, in expectation of being paid again; but they muſt not do it at their own expence, on the condition of no purchaſe no pay.

MAJOR, in the art of war, the name of ſeveral officers of very different ranks and functions; as, 1. Major-general, the next officer to the lieutenant-general: his chief buſineſs is to receive the orders from the general, or in his abſence from the lieutenant-general of the day; which he is to diſtribute to the brigade-majors, with whom he is to regulate the guards, convoys, and detachments. When there are two attacks at a ſiege, he commands that on the left. He ought to be well acquainted with the ſtrength of each brigade, of each regiment in particular, and to have a liſt of all the field officers. In ſhort, he is in the army, what a major is in a regiment. He is allowed an aid de camp, and has a ſerjeant and fifteen men for his guard. 2. Major of a brigade, the officer who receives the orders from the major-general, and afterwards delivers them to the adjutants of the regiments at the head of the brigade; where he takes and marches the detachments, *&c.* to the general rendezvous. He ought to be an expert captain, to know the ſtate and condition of the brigade, and keep a roll of the colonels, lieutenant-colonels, majors, and adjutants. 3. Major of a regiment, the

next officer to the lieutenant-colonel, generally promoted from the oldeft captain. He is to take care that the regiment be well exercifed, to fee it march in good order, and to rally it in cafe of its being broke. He is the only officer among the foot that is allowed to be on horfeback in time of action, that he may the more readily execute the colonel's orders, either in advancing or drawing off the regiment. 4. Major of a regiment of horfe, is the firft captain, who commands in the abfence of the colonel. 5. Town-major, the third officer in a garrifon, being next to the deputy-governor. He ought to underftand fortification, and hath charge of the guards, rounds, patrols, *&c.* His bufinefs is alfo to take care that the foldiers arms are in good order; he likewife orders the gates to be opened and fhut, and gives the governor an account of all that paffes within the place.

There are alfo aids-major, drums-major, *&c.* fo called from their preheminence above others of the fame denomination.

MAJOR, in law, a perfon who is of age to manage his own affairs. See the articles AGE and MINOR.

MAJOR, in logic, the firft propofition of a fyllogifm. See the article SYLLOGISM.

MAJOR and MINOR, in mufic, fignify imperfect concords, which differ from each other by a femi-tone minor. See the article CONCORD.

MAJOR-DOMO, an appellation formerly given to the fteward or mafter of the king's houfhold.

MAJORANA, MARJORAM, in botany, is comprehended by Linnæus among the origanums. See ORIGANUM.

Marjoram is attenuant and detergent, and recommended in nervous cafes, and difeafes of the lungs, as alfo in epileptic cafes.

MAJORCA, the capital of a fpanifh ifland of the fame name: eaft long. 2° 30′, north lat. 39° 30′.

This ifland is in the Mediterranean Sea, about fixty miles long, and forty-five broad, fituated about eighty miles fouth of the coaft of Catalonia, and an hundred miles eaft of Valencia.

MAJORITY, the greater number of perfons. Several things are determined by a majority. Thus our laws are enacted by a majority of members of parliament, and the members themfelves are chofen by a majority of electors: alfo the act of the major part of every corporation, is accounted the act of the corporation; for where the majority is, there the law adjudges to be the whole.

MAIRE, or *ftreights of le* MAIRE, is a paffage to Cape Horn, fituated between Terra del Fuego in fouth America, and Statten ifland; which being difcovered by Le Maire, obtained his name.

MAIZ, or INDIAN CORN, a plant called by Linnæus zea. See the article ZEA.

MAKE, in law, is to perform and execute. Thus to make his law, is to perform that law by which a man had formerly bound himfelf; and to make fervices and cuftoms, means no more than to perform them.

MAKING-UP, among diftillers, the reducing fpirits to a certain ftandard of ftrength, ufually called proof, by the admixture of water; which fhould be either foft and clear river-water, or fpring-water rendered foft by diftillation. See the articles LOWERING and PROOF.

MALA, the cheek, in anatomy. See the article CHEEK.

The cheeks are compofed of two bones of a hard fubftance, called by anatomifts offa malarum, offa jugalia, or zygomatica. See FACE, MAXILLA, *&c.*

MALABAR, the fouth-weft coaft of the peninfula of hither India, about 400 miles long, and 100 broad, bounded by Vifiapour, on the north; by the mountains of Baligate, on the eaft; and by the Indian ocean on the weft and fouth.

MALACCA, the moft foutherly part of the further peninfula of India, about 600 miles long, and generally about 200 miles broad; bounded by Siam, on the north; by the bay of Siam and the Indian ocean, on the eaft; and by the ftreights of Malacca, on the fouth-weft. The capital of this country, which is alfo commonly called Malacca, is fituated in 100° of eaft long. and 2° 30′ north lat.

MALACHI, or *the prophecy of* MALACHI, a canonical book of the Old Teftament, and the laft of the twelve leffer prophets. Malachi prophefied about three hundred years before Chrift, reproving the Jews for their wickednefs after their return from Babylon, charging them with rebellion, facrilege, adultery, prophanenefs, and infidelity, and condemning the priefts for being fcandaloufly carelefs in their miniftry: at the fame time not forgetting to encourage the pious few, who, in that corrupt age, maintained their integrity. This prophet diftinctly points

at the Messiah, who was suddenly to come to his temple, and to be introduced by Elijah the prophet, that is, by John the baptist, who came in the spirit and power of Elias or Elijah.

MALACHITES, or MOLOCHITES, in natural history, &c. a species of jasper, supposed to be possessed of amuletic virtues. See JASPER and AMULET.

MALACIA, μαλακια, in medicine, is a languishing disorder incident to pregnant women, in which they long sometimes for one kind of food, and sometimes for another, and eat it with an extraordinary greediness. When women labouring under this disorder begin to abstain from the improper and absurd things they were fond of, and with less reluctance use laudable and wholesome aliments, it is an infallible sign of a beginning cure and approaching health. Pregnant women are generally freed from the malacia, about the fourth month; but if it continues longer it is dangerous, because the peccant humours are deeply rooted. For the cure of this disorder, in pregnant women, but few medicines are recommended for fear of abortion: however gentle medicines may be used for evacuating and corroborating the stomach. In young women labouring under a chlorosis, this distemper is cured by the same medicines that are proper for removing the chlorosis. See the article CHLOROSIS.

MALACOPTERYGIOUS, among ichthyologists, an appellation given to one of the five orders of fishes, from their having the rays of their fins bony, but not pointed or sharp at the extremities, like those of acanthopterygious fishes. See the articles FISH and ICHTHYOLOGY.

MALACOSTOMOUS FISHES, those destitute of teeth in the jaws, called in english leather-mouthed: as the tench, carp, bream, &c. See TENCH, &c.

MALACOSTRACA, in zoology, the same with crustaceous animals.

MALAGA, a city and port of Spain, in the province of Granada, situated in the Mediterranean, sixty-six miles north-east of Gibraltar: west long. 4° 45′, north lat. 36° 40′.

MALAGMA, a cataplasm. See the article CATAPLASM.

MALAMOCCA, a small island and port-town in the lagunes of Venice, situated five miles south of that city.

MALANDERS, a disease incident to horses, proceeding from corrupt blood, hard labour, or being over-ridden, and sometimes for want of clean keeping and rubbing. It consists of certain chops or chinks which appear on the inside of the fore legs, just against the bending of the knee, which discharge a red, sharp, pungent water. The surest method of cure is to wash the part very clean with urine, or oil of nuts shaken with water, and then to mingle equal quantities of linseed-oil and aqua-vitæ, stirring and shaking them till the mixture grows white, with which anoint the part once a day.

MALDIVA ISLANDS, are about a thousand small islands, in the Indian ocean, 500 miles south-west of the continent of the hither India, extending from the second degree of south latitude, to the seventh degree of north latitude.

MALDON, a port-town of Essex, ten miles east of Chelmsford. It sends two members to parliament.

MALE, *mas*, among zoologists, that sex of animals which has the parts of generation without the body. See the articles ANIMAL and GENERATION.

The term male has also, from some similitude to that sex in animals, been applied to several inanimate things: thus we say, a male-flower, a male-screw, &c. See the articles FLOWER and SCREW.

MALE BALSAM, *momordica*, in botany. See the article MOMORDICA.

MALICE, in law, is a premeditated design to do mischief to another.

Malice is necessary to constitute the crime of murder. So where a person has a malicious intent to kill, and in the execution of this malicious design kills a third person by accident, he is, on account of his malice, deemed guilty of murder. See the article MURDER.

MALIGNANT, among physicians, a term applied to diseases of a very dangerous nature, and generally infectious: such are the dysentery, hospital-fever, &c. in their worst stages. See DYSENTERY, HOSPITAL-FEVER, PETECHIÆ, &c.

MALINES, or MECHLIN. See the article MECHLIN.

MALL, or SEA-MALL, in ornithology, the english name of the lesser gull, with a grey back and spotted neck, and about the size of the common tame pigeon. See the article LARUS.

There is also another species called by the name of mall, as large as a pullet.

MALLEABLE, a property of metals, whereby they are capable of being extended under the hammer. See the articles DUCTILITY and METAL.

MALLEOLUS, in anatomy, a name given by anatomifts to the inferior extremities of the tibia and fibula.

MALLET, a kind of large wooden hammer ufed by artificers who work with a chiffel, as fculptors, mafons, and ftonecutters, whofe mallets are commonly round, and by joiners, carpenters, *&c.* who work with fquare-headed mallets.

MALLEUS, in anatomy, a bone of the ear, fo called from its refemblance to a mallet, and in which is obferved the head, the neck and handle, which is joined to the membrane of the tympanum. See EAR.

MALLING, a market-town of Kent, five miles weft of Maidftone.

MALLO, a town of Ireland, in the county of Cork, feventeen miles north of Cork city.

MALLOW, MALVA, in botany. See the article MALVA.

Vervain MALLOW. See ALCEA.

MALMEDY, a town of Germany, in the circle of Weftphalia, and bifhopric of Liege; nine miles fouth of Limburgh.

MALMOE, a port-town of Sweden, in the province of Gothland, twenty miles fouth-eaft of Copenhagen.

MALMSBURY, a borough-town of Wiltfhire, thirty miles fouth-weft of Salifbury: it fends two members to parliament.

MALMSEY, a rich kind of wine, fo called, as being brought from Malvafia, in the Morea; for the duty on which fee the article WINE.

MALO, or *St.* MALO, a city and port-town of France, in the province of Britany, fituated on a rock, in the englifh channel, but joined to the continent by a caufeway: weft long. 2°, north lat. 48° 40′.

MALOPE, *betony-leaved* MALLOW, in botany, a genus of the monadelphia-polyandria clafs of plants, the flower of which is like that of the common malva: the fruit is compofed of a number of conglomerated capfules, each containing a fingle kidney fhaped feed.

MALPAS, a market-town of Chefhire, ten miles fouth-eaft of Chefter.

MALPIGHIA, in botany, a genus of the decandria-trigynia clafs of plants; the flower of which is compofed of five large, hollow, kidney-fhaped petals, with long and linear ungues: the fruit is a large globofe berry, with one cell, containing three offeous, oblong, obtufe, and angulated feeds; each having an oblong, and obtufe kernel.

MALPLAQUET, a village in the auftrian Netherlands, in the province of Hainault, about feven miles from Mons.

MALT, is barley prepared, to fit it for making a potable liquor called beer, or ale, by ftopping it fhort at the beginning of vegetation.

In making malt from barley, the ufual method is to fteep the grain in a fufficient quantity of water, for two or three days, till it fwells, becomes plump, fomewhat tender, and tinges the water of a bright brown, or reddifh colour. Then this water being drained away, the barley is removed from the fteeping ciftern to the floor, where it is thrown into what is called the wet couch; that is, an even heap, rifing to the height of about two feet. In this wet couch, the capital part of the operation is performed; for here the barley fpontaneoufly heats, and begins to grow, fhooting out firft the radicle, and if fuffered to continue, then the plume, fpire or blade. But the procefs is to be ftopped fhort at the eruption of the radicle, otherwife the malt would be fpoiled. In order to ftop it, they fpread the wet couch thin over a large floor, and keep turning it once in four or five hours, for the fpace of two days, laying it fomewhat thicker each time. After this, it is again thrown into a large heap, and there fuffered to grow fenfibly hot to the hand, as it ufually will in twenty or thirty hours time; then being fpread again, and cooled, it is thrown upon the kiln, to be dried crifp without fcorching.

This is the general procefs of malting, in which almoft every maltfter has his fecret, or particular way of working. But to render the operation perfect, the following cautions muft be obferved: 1. That the barley be newly thrafhed, or at leaft newly winnowed. 2. That it be not mixed, or made up of different forts. 3. That it be not over fteeped in the ciftern, or fo long as to make it foft. 4. That it be well drained. 5. That it be carefully looked after in the wet couch, fo as to ftop the firft tendency of the blade to fhooting. 6. Another caution is, to turn the wet couch infide outermoft, if the barley comes, and fhoots more in the middle of the heap than on the fides. 7. To keep it duly turning, after it is out of the wet couch. 8. To give it the proper heating in the dry heap. 9. To dry and crifp it thoroughly upon the kiln, but without a fierce fire, fo as to be feveral days in drying a kiln

of pale malt. And if these directions be carefully observed, the malt will always be good.

The method of malting indian corn or Virginia-wheat, is much less laborious. For, if this corn be buried two or three inches deep in the earth, and covered with the loose mould, dug up to make room for it, in ten or twelve days time the corn will sprout, and appear like a green field; at which time being taken up, and washed or fanned from its dirt, it is immediately committed to the kiln, and by this means it becomes good malt. It is observable of this corn, that both its root and blade must shoot to a considerable length, before it will make malt; and, perhaps, this is the case in all large bodied grain.

The importation of malt from beyond the seas is prohibited: and on its being exported, it is not only freed from paying the excise of 6 d. a bushel, but a bounty is allowed by act of parliament, for which see the article CORN.

Malt-liquors have different names, and different virtues, from the different methods of preparing the malt, whence they are distinguished into pale and brown; and from the various methods taken in brewing the liquors, whence they are divided into ale and beer, strong and small, new and old. See BREWING

The colour of the liquor, and many of its effects, depend on the manner of drying the malt it is brewed with; that which has the palest tinge, is made with malt but slenderly dried; whereas that which is high coloured, is made with malt that is high dried, or roasted, as it were, in comparison of the other; and amber-ale is made of a mixture of both.

Another difference in the preparations of malt-liquors consists in the larger quantity of hops in beer, and the smaller in ale; for hops add something of an alkaline nature to the liquor, and not only render it more easy of digestion, and secretion in the body, but while it is in the liquor, prevent its running into such cohesions, as would make it ropy, vapid and sour: for this reason Dr. Quincy is of opinion, that for one constitution injured by beer, there are numbers spoiled by ale, which is apt to stuff the vessels with slime and viscidity, to make the body unwieldy and corpulent, and to pave the way for cachexies, the jaundice, asthmas, and the dropsy. The different degrees of strength in malt-liquors, also make them produce different effects. The stronger they are, the more viscid parts they carry into the blood: they are therefore in general the more wholesome for being small; that is, of such a strength as to carry some degree of warmth into the stomach, but not so as to prevent their being proper diluters of our necessary food. Indeed people of robust constitutions, who labour very hard, may dispense with reasonable quantities of the strongest; especially as their food is frequently poor and slender enough, the deficiencies of which this supplies; and their continual exercise and strength of body, digests and breaks the viscidities of the drink into convenient nourishment: though in persons of another habit, and way of living, they would only produce obstructions and ill humours. As to the age of these liquors, it has somewhat the same effect as hops, for those that are longest kept, are certainly least viscid: for age, by degrees, breaks their viscid parts, and by rendering them smaller, makes them fitter for secretion.

MALT-SPIRITS. See the articles DISTILLERY and SPIRIT.

MALTA, the capital of a small island of the same name in the Mediterranean, is situated in east long. 15°, north lat. 35° 15′; consisting of three towns, separated by channels, which form so many peninsulas of solid rock, rising a great height above the sea: the situation is strong, and no art is wanting in the fortifications to render it impregnable.

Knights of MALTA, otherwise called, *hospitalers of St. John of Jerusalem*, a religious military order, whose residence is in the island of Malta. The order consists of three estates, the knights, chaplains, and servants at arms: there are also priests who officiate in the churches, friar-servants, who assist at the offices, and donnes or demicrosses; but these are not reckoned constituent parts of the body: the government of the order is mixt, being partly monarchical, and partly aristocratical: the grand master is sovereign. The knights formerly consisted of eight different languages, but now only seven, the english having withdrawn themselves. None are admitted into this order but such as are of noble birth: the knights are of two sorts, those who have a right to be candidates for the dignity of grand master, called grand crosses, and those who are only knights assist-

assistants: they never marry, yet have continued from 1090 to the present time. The knights are received into this order either by undergoing the trials prescribed by statutes, or by dispensation.

Earth of MALTA. See the article BOLE.

MALTHA, in antiquity, a kind of cement, of which there were two sorts, native and factitious; one of the latter sort, much in use, consisted of pitch, wax, plaster, and grease. Another kind used by the Romans in their aqueducts, was made of lime slacked in wine, incorporated with melted pitch, and fresh figs. Natural maltha is a kind of bitumen, wherewith the Asiatics plaster their walls; and which being once set on fire, water makes it burn more fiercely.

MALTON, a borough of Yorkshire, situated on the river Derwent, twenty miles north-east of York. It sends two members to parliament.

MALVA, MALLOW, in botany, a genus of the monadelphia-polyandria class of plants, the corolla whereof consists of five petals, vertically cordated, plane, and growing together at the base; the fruit consists of a great number of capsules, joined together by an articulation, and of an orbicular depressed figure, separating from one another, and opening inwardly: the receptacle affixed to the capsules is columnar: the seed is solitary and kidney-shaped.

Mallow is one of the five emollient herbs, being loosening, cooling, and mollifying; a cataplasm of the leaves of this plant eases the sting of bees and wasps.

MALVASIA, or NAPOLI DE MALVASIA, a city and port-town of European Turky, in the province of Morea, situated in the Archipelago, thirty miles east of Misitra.

MALUS, the APPLE-TREE, in botany, is, according to Linnæus, a species of the pyrus. See APPLE and PYRUS.

MAMALUKES, the name of a dynastie that reigned in Egypt.

The mamalukes were originally turkish and circassia-slaves, bought of the Tartars by Melicsaleh, to the number of a thousand, whom he bred up to arms, and raised some to the principal offices of the empire. They killed sultan Moadam, to whom they succeeded.

Others say, that the mamalukes were ordinarily chosen from among the christian slaves, and that they were the same thing in a great measure with the janissaries among the Turks. They never married; they first are said to have been brought from Circassia, and some have supposed that they began to reign about the year 869.

MAMMÆ, the BREASTS, in anatomy. See the article BREAST.

MAMMEA, in botany, a genus of the polyandria-monogynia class of plants, the corolla whereof consists of four roundish concave patent petals, greater than the cup: the fruit is a carnose berry, very large, pointed, with the style of a spherical figure, and containing only one cell: the seed, being either four or one in number, is callous, and of an oval figure.

MAMMIFORM, in anatomy, a name given to apophyses of the bone in the back part of the scull, so called from their resembling a breast.

MAMMILLARY, MAMMILLARIS, in anatomy, an epithet given to two little protuberances, somewhat resembling the nipples of the breast, found under the four ventricles of the brain, and supposed to be the organs of smelling. These are called apophyses mammillares. There is also a muscle called mamillaris, or mastoides, serving to stoop the head.

MAMMOTH's TEETH, in natural history, certain large fossile teeth, found in great plenty in Russia, and supposed to have belonged to elephants.

MAN, *homo*, in zoology, is justly ranked at the head of the animal part of the creation; making a distinct genus of that order of quadrupeds, which Linnæus calls anthropomorpha, from their resemblance to the human form. See the article ANTHROPOMORPHA.

The same author distinguishes the race of mankind, according to their different colours, into the Europeans, or white men; the Americans, or ruddy-coloured men: the Asiatics, or tawney-coloured men; and those of Africa, or blacks.

Nosce te ipsum, know thyself, is a precept worthy of the law-giver of Athens, the antient seat of polite literature; an important branch of knowledge, which may be reduced to the following heads. 1. In a religious view, *theologicè*, that you was created with an immortal soul, after the image of God. 2. In a moral sense, *moraliter*, that you alone was blessed with a rational soul, to be employed to the praise of the creator. 3. With respect to the other works of the creation, *naturaliter*, that you are constituted their lord, for whose use they were made. 4. In

In a physiological sense, *physiologicè*; the most perfect and amazing fabric of your body. 5. With regard to diet, *diæteticè*, what things are useful, and what hurtful, in this respect. 6. In a pathological sense, *pathologicè*, how frail you are, and how subject to a thousand calamities.

These are the heads, which, according to Linnæus, comprehend the knowledge of man, considered as an individual; a branch of knowledge so essential to the human race, that, without it, he seems to doubt whether any other characters be sufficient to entitle one to be ranked among mankind: for he adds, *Hæc si noveris,* HOMO *es, et a reliquis animalibus distinctissimum genus.*

The whole of this work may, in some respect, be accounted an analysis of MAN; as comprehending his knowledge of God, of himself, and of natural and artificial objects. See the INTRODUCTION.

We have traced him from his conception to his birth, infancy, puberty, married state, old age, and death. We have considered him as a parent, a child, and a member of society, in all the various situations and connections of human life. We have anatomized, so to speak, his mental faculties no less than the members of his body. In short, to give a just notion of mankind, and of their personal and social capacities, of their manners, customs, opinions, advantages and disadvantages, has been our study through the whole of this work; which, being reduced to the form of a dictionary, may, with the greatest ease, be consulted at pleasure, on whatever subject the reader desires to be informed.

As to the articles which more immediately concern mankind, the reader may turn to GENERATION, FOETUS, INFANT, PUBERTY, MARRIAGE, DIET, DISEASE, MORTALITY, KNOWLEDGE, REASON, &c.

MANAGE, or MANEGE. See MANEGE.

MANAR, an east indian island, situated between Ceylon and the continent.

MANCHA, a territory of Spain, in the province of New Castile.

MANCHE, the french name for the english Channel.

MANCHESTER, a large town of Lancashire, forty miles south-east of Lancaster.

MANDAMUS, in law, a writ that issues out of the court of king's bench, sent to a corporation, commanding them to admit or restore a person to his office. This writ also lies where justices of the peace refuse to admit a person to take the oaths, in order to qualify himself for enjoying any post or office; or where a bishop or archdeacon refuses to grant a probate of a will, to admit an executor to prove it, or to swear a church-warden, &c.

MANDARINS, a name given to the magistrates and governors of provinces in China, who are chosen out of the most learned men, and whose government is always at a great distance from the place of their birth. Mandarin is also a name given by the Chinese to the learned language of the country; for besides the language peculiar to every province, there is one common to all the learned in the empire, which is in China what latin is in Europe; this is called the mandarin tongue, or the language of the court.

MANDATE, in law, a judicial commandment to do something. See the article MANDAMUS.

MANDATE, in the canon-law, a rescript of the pope, commanding an ordinary collator to put the person therein-named in possession of the first vacant benefice in his collation.

MANDERSCHEIT, a city of Germany, in the electorate of Triers, and the capital of the county of Manderscheit: east long. 6° 32′, north lat. 50° 20′.

MANDRAGORA, MANDRAKE, in botany, a genus of the pentandria-monogynia class of plants, the corolla whereof consists of a single erect hollow petal, growing gradually wider from the base; being a little larger than the cup, and divided beyond the middle into five lanceolated segments: the fruit is a great globose berry, containing two cells: the receptacle is fleshy and convex on both sides: the seeds are numerous and kidney shaped. The mandragora has been esteemed a poison, by many; and by others, it is declared innocent: the bark of the root was once used as a narcotic; but at present the leaves are only used in medicine.

MANFREDONIA, a city and port of the kingdom of Naples, situated in the bay of Manfredonia, in the gulph of Venice: east long. 16° 40′, north lat. 41° 20′.

MANDREL, a kind of wooden pulley, making a member of the turner's lathe, of which there are several kinds, as the flat mandrels, which have three or more little pegs or points near the verge, and are used for turning flat boards on; the pin mandrel are those which have a long wooden shank to fit into a large hole made

made in the work to be turned; hollow mandrels are those hollow of themſelves, and uſed for turning hollow work; ſcrew mandrels for turning ſcrews, &c.

MANE, the hair hanging down from a horſe's neck, which ſhould be long, thin, and fine; and if frizzled, ſo much the better.

MANEGE, or MANAGE, the exerciſe of riding the great horſe, or the ground ſet apart for that purpoſe; which is ſometimes covered, for continuing the exerciſe in bad weather; and ſometimes open, in order to give more liberty and freedom both to the horſeman and horſe.

One way or other, we always ſuppoſe a center in the middle of the manege-ground, for regulating the rounds and volts. Sometimes this center is diſtinguiſhed by a pillar fixed in it, to which they tie the horſe when he begins to learn: upon the ſide of the manege other pillars are placed, two by two, in order to teach horſes to raiſe the fore-quarters, by tying them with ropes. See PILLAR.

The manege or exerciſe of a horſe, is a particular way of working or riding him. Make your horſes work upon the air and the manege that you uſed to put them moſt to. A horſe is ſaid to manege, when he works upon volts and airs, which ſuppoſes him broke and bred. A horſe is ſaid to be thoroughly maneged, or a finiſhed horſe, that is well broke and bred, and confirmed in a particular air or manege. High manege, is the high or raiſed airs which are proper for leaping-horſes.

In chooſing a horſe for the manege, make choice of a horſe of a middle ſize, that is lively, full of ſpirit and action, ſhort truſſed, well coupled, having good feet and legs, and ſhoulders very eaſy and ſupple. It ought alſo to be obſerved, that horſes that have thick, ſtiff, and ſhort joints, that is no ways flexible or pliant, are unfit for the manege; for glib and bending joints, if they be not too long, are one of the chief qualities requiſite in a fine and delicate horſe of manege.

As for the age moſt proper to begin to work a horſe deſigned for the manege, he ſhould not be too young, not only becauſe his apprehenſion is not yet come to him, but alſo becauſe a horſe of three years old being but a griſtle, ſtopping and going back will ſpoil him, by ſtraining his back and ſtretching his hams.

MANES, in the pagan ſyſtem of theology, a general name for the infernal deities, or gods of hell.

The antients comprehended under manes not only Pluto, Proſperine, and Minos, but the ſouls likewiſe of the deceaſed were taken into the number, and eſteemed gods of hell. It was uſual to erect altars and offer libations to the manes of deceaſed friends and relations. One branch of the magic art among the pagans conſiſted in conſulting the manes of the dead in matters of importance: this was called Necromancy. See NECROMANCY.

MANGALOR, or MANGUELOR, a port-town of the Hither India, ſituated on the Malabar-coaſt, in eaſt long. 74°, north lat. 13°.

MANGANESE, MAGNESIA, in natural hiſtory, a poor kind of iron-ore. See the article IRON.

It is a denſe, heavy ſubſtance in its fineſt pieces; being compoſed of a number of broad and thick ſtriæ irregularly laid together, and much reſembling thoſe of native antimony; in theſe maſſes it is ſometimes reddiſh, ſometimes of a dark grey, and ſometimes of a fine pale light grey, approaching to the colour of the fineſt poliſhed iron: but there is a leſs perfect kind in which the whole maſs ſeems only to conſiſt of a number of irregularly figured pieces, of a brittle and ſomewhat gloſſy ore, blended very looſely together.

Manganeſe is found in great abundance in the german and ſwediſh mines, as alſo in France, Italy, and England; but ours is not equal in beauty or goodneſs to the german. It is recommended by authors as an aſtringent, and ordered to be given after calcination in hæmorrhages; but it is very improper for internal uſe. It is of great ſervice, however, to the glaſſmen, in clearing away the greeniſh colour from their white glaſs while in fuſion. See GLASS.

MANGIFERA, in botany, a genus of the pentandria-monogynia claſs of plants, the calyx of which is a five-leaved perianthium; the corolla conſiſts of five ſpear-ſhaped petals, longer than the cup; the fruit is a kidney-ſhaped oblong gibbous, compreſſed, drupe: the ſeed is an oblong compreſſed woolly nut.

MANGOSTANS, or MAGOUSTANS, the fruit of the garcinia. See GARCINIA.

MANHEIM, a city of Germany, in the palatinate of the Rhine, ſituated at the con-

confluence of the Rhine and Neckar: east long. 7° 20′, north lat. 49° 30′.

MANIA, MADNESS, in medicine. See the article MADNESS.

MANICHEES, in church-history, a sect of christian heretics in the third century, the followers of Manes, who made his appearance in the reign of the emperor Probus; pretending to be the comforter, whom our Saviour promised to send into the world. He taught that there are two principles, or gods, coeternal and independant on each other, the one the author of all evil, and the other, of all good; a doctrine which he borrowed from the persian magi. He held that our souls were made by the good principle, and our bodies by the evil one, and that the souls of his followers passed through the elements to the moon, and from thence to the sun, where being purified, they then went to God, and became united with his essence; but as for the souls of other men, they either went to hell, or were united to other bodies. He alledged, that Christ had his residence in the sun, the Holy Ghost in the air, wisdom in the moon, and the father in the abyss of light. He is also charged with denying the resurrection and condemning marriage; with teaching that Christ was the serpent that tempted Eve; with forbidding the use of eggs, cheese, milk and wine, as proceeding from the bad principle; with using a different kind of baptism from that of the church; with teaching that magistrates were not to be obeyed, and with condemning the most lawful wars.

MANICORDON, or MANICHORD, a musical instrument in the form of a spinet; the strings of which, like those of the clarichord, are covered with little pieces of cloth, to deaden, as well as to soften, their sound; whence it is also called the dumb spinet. It is much used in nunneries, because the nuns may play upon it without disturbing that silence which they are obliged to observe in their cells.

MANIFESTO, a public declaration made by a prince in writing, shewing his intentions to begin a war, or other enterprize, with the motives that induce him to it, and the reasons on which he founds his rights and pretensions.

MANIHOT, or MANIOC, in botany, a plant otherwise called jatropha. See the article JATROPHA.

MANILLE, in commerce, a large brass-ring in the form of a bracelet, either plain or engraven, flat or round.

Manilles are the principal commodities which the europeans carry to the coast of Africa, and exchange with the natives for slaves. These people wear them as ornaments on the small of the leg, and on the thick part of the arm above the elbow. The great men wear manilles of gold and silver, but these are made in the country by the natives themselves.

MANINGTREE, a market-town of Essex, twenty-five miles north-east of Chelmsford.

MANIPULUS, in roman antiquity, a body of infantry, consisting of two hundred men, and constituting the third part of a cohort. See the article COHORT.

Among physicians, the term manipulus signifies a handful of herbs or leaves, or so much as a man can grasp in his hand at once; which quantity is frequently denoted by the abbreviature, M, or m.

MANIS, the SCALY LIZARD, in zoology, a genus of quadrupeds, of the order of the agriæ; the body of which is covered with a kind of scales, and it has no ears: there is but one known species of this genus, which has been confounded with the lizards: this is an animal of great beauty, and perhaps one of the most singular in the world; its aspect has a great shew of terror, but it is the most inoffensive creature imaginable: its form is somewhat like the lizard: it is about four feet in length, and its body, in the broadest part, which is towards the hinder legs, is about ten inches in breadth; it is of a rounded figure on the back; the legs are short, and stand about a foot distance; the rest of the creature, from the hinder part to the extremity, is a tail, broad, thin, and between two and three feet in length; it is not connected to the hinder-part of the body, but is continuous with it: the whole upper surface of this creature, the back, and the outsides of the legs are covered with an armature of scales; the belly and insides of the legs are naked; the scales are of a firm substance, and have very much the appearance of tortoise-shell; they are on the body two inches in length, and more than an inch in breadth, of an oval figure, and each terminating in a kind of spine; the head is small, of a conic figure, about three inches in diameter at the base, and thence gradually growing smaller to the snout, which is sharp and naked;

naked; the head is covered with the ſame ſort of ſcales with that of the body, only they are ſmaller; there are no teeth in the mouth, but the tongue is ten inches or more in length; the whole creature is of a brown colour; the ſtriated parts of the ſcales is of a red, duſky brown; the ſmooth, poliſhed part has an admixture of yellow; the ſides of the body, and thoſe of the tail, are of a ſerrated form, the ſcales terminating one over another at ſome diſtance; the legs are robuſt, and the claws very ſtrong and thick; it is a native of the eaſt Indies and South America, lives in the woods, and feeds on inſects, as the ant-bear does, thruſting out its tongue till covered with them, and then drawing it in loaded with the food.

MANNA, in the materia medica, the concreted juice of ſome vegetable, naturally exſudating from it, ſoluble in water, and not inflammable.

It is a honey-like juice, brought to us from Calabria and Sicily, ſometimes in ſmall granules, or drops of an irregular figure, roundiſh, oblong, crooked, and ſometimes contorted. It ſhould be choſen whitiſh, or at the utmoſt, with only a faint caſt of yellow, not too heavy, in regular dry granules, or in moderately long ſtriæ or flakes, of a pleaſant taſte, and diſſolving wholly in the mouth, not leaving a farinacious ſubſtance behind it, as much of the common manna does, that has been adulterated with honey and flour.

Manna is the mildeſt and ſafeſt of all purges, and may be given to children, to women with child, and to people of the moſt tender conſtitutions, with perfect ſafety; and it never fails gently to move the bowels, and to carry off the thick viſcid foulneſſes from them. Its doſe is from two drams to an ounce or more, and is moſt conveniently given in ſolution. When required to work more violently than it naturally would, it may be quickened with an addition of Glauber's ſalt.

Manna is obtained from ſeveral ſorts of trees, eſpecially aſh; and the fineſt kind is that which oozes naturally out of the leaves. Beſides which there is another coarſer kind obtained by wounding the bark of the trunk and branches of theſe trees.

In the french ſhops there is alſo met with a manna, produced from the larch-tree; and our black-thorn, or ſloe-tree, ſometimes yields a true manna from the ribs of the leaves. The manna perſicum, or perſian manna, is obtained from a ſhrub called alhagi. See the article ALHAGI.

As to the manna mentioned in ſcripture, it could not be true manna, becauſe it melted with the heat of the ſun; which true manna does not, but rather hardens by it.

The antient Greeks likewiſe called the ſmall fragments of frankincenſe, by the name manna.

MANNER, in painting, a habitude that a man acquires in the three principal parts of painting, the management of colours, lights and ſhadows, which is either good or bad, according as the painter has practiſed more or leſs after the truth, with judgment and ſtudy. But the beſt painter is he, who has no manner at all. The good or bad choice he makes is called goûte.

MANNERS, in poetry, the inclinations, genius and humour, which the poet gives to his perſons, and whereby he diſtinguiſhes his characters. See the article CHARACTER.

MANNING, in the navy, denotes the providing a ſhip or fleet with a ſufficient number of men for an expedition.

In manning the navy, it is uſual to promiſe by proclamation, a bounty to all ſeamen, and able-bodied landmen, who come into the ſervice by a certain time, which is frequently two months pay, and ſeldom more. This does indeed prevail on many, yet great numbers conceal themſelves until the fleet is at ſea, and others lurk about even till the time limited for ſuch bounty is near expired, which does not a little prevent fleets oftentimes from being in a readineſs for an early expedition.

And as ſeamen are thus encouraged to enter themſelves voluntarily, ſo there is another method uſed to compel them to it, and that is, preſſing them by warrants from the lord high admiral to the captains, and by them aſſigned to their lieutenants; and to render this the more effectual, veſſels are purpoſely hired into the ſervice to proceed from place to place with thoſe officers, and their preſs-gangs, not only to receive volunteers, but to impreſs what men they can light on. Notwithſtanding this, their ſucceſs is very uncertain, and always expenſive: therefore, it is much to be wiſhed, in a matter of ſo great a conſequence to the nation, that more ſpeedy and effectual methods

methods could be taken for manning the fleet.

MANOMETER, or MANOSCOPE, an inſtrument to ſhew or meaſure the alterations in the rarity or denſity of the air. The manometer differs from the barometer in this, that the latter only ſerves to meaſure the weight of the atmoſphere, or of the column of air over it; but the former the denſity of the air in which it is found, which denſity depends not only on the weight of the atmoſphere, but alſo on the action of heat and cold, *&c.* Authors, however, generally confound the two together, and Mr. Boyle himſelf gives us a very good manometer of his contrivance, under the title of a ſtatical barometer. See BAROMETER.

MANOR, an antient royalty or lordſhip, formerly called a barony, conſiſting of demeſnes, ſervices, and a court-baron; and comprehending in it meſſuages, lands, meadow, paſture, wood, rents, an advowſon, *&c.* It may contain one or more villages, or hamlets, or only a great part of a village, *&c.*

A manor is a noble kind of fee, granted in part to tenants for certain ſervices to be performed, and partly reſerved to the uſe of the lord's family, with juriſdiction over the tenants, for their farms or eſtates.

There are capital manors or honours, that have other manors under them: and alſo cuſtomary manors granted by copy of court-roll, the lords of which have power to hold courts, and grant copies, *&c.*

MANS, the capital of the territory of Maine, in the province of Orleanois, in France: eaſt long. 5′, north lat. 48° 6′.

MANSE, in law, is a farm-houſe, with land belonging to it.

MANSFIELD, a city of Germany, the capital of a county of the ſame name, in the circle of Upper Saxony: eaſt long. 11° 45′, north lat. 51° 36′.

MANSFIELD is alſo a market-town of Nottinghamſhire, twelve miles north of Nottingham.

MANSION, in law, is the chief dwelling houſe of a lord within his fee, or the capital meſſuage, or manor-houſe.

Manſion alſo, in a more general ſenſe, ſignifies any dwelling-houſe, and even a chamber in one of the inns of court comes under the denomination of a manſion; but this is not the caſe, with reſpect to any other chamber in which a perſon lodges.

MANSLAUGHTER, generally termed homicide, is killing a perſon without permeditated malice.

Manſlaughter differs from murder, in its not being committed from the dictates of a former malicious intention; and from chance-medley, in its being done with a preſent intention to kill. Thus, where two perſons, who before meant no harm to each other, meet and quarrel, and in the heat of paſſion one kills the other; in this caſe he is guilty of manſlaughter. If two perſons fall out and fight, and the one breaks the other's ſword, on which a ſtander by lends him another, with which the adverſary is killed, it is manſlaughter both in the ſlayer and ſtander-by. And where a man is taken in adultery with another perſon's wife, and the huſband immediately draws and kills him, it is only manſlaughter, the huſband having had a juſt provocation for ſo doing: but where any other perſon ſtabs another, who has not a weapon drawn, or ſtruck firſt, ſo that the perſon ſtabbed dies within ſix months, notwithſtanding there was not malice aforethought, it is felony without benefit of clergy. In other caſes, though manſlaughter is accounted felony, yet for the firſt offence the offender is allowed the benefit of clergy.

MANTELETS, in the art of war, a kind of moveable parapets, made of planks about three inches thick, nailed one over another, to the height of almoſt ſix feet, generally caſed with tin, and ſet upon little wheels, ſo that in a ſiege, they may be driven before the pioneers, and ſerve as blinds to ſhelter them from the enemy's ſmall ſhot. See plate CLXX. fig. 3.

There are other ſorts of mantelets covered on the top, whereof the miners make uſe to approach the walls of a town or caſtle.

MANTIS, the PRAYING LOCUST, in zoology, a ſpecies of gryllus, ſo called from the poſture wherein it uſually holds its anterior pair of legs.

MANTLE, or MANTLE-TREE, in architecture, the lower part of the chimney, or that piece of timber which is laid acroſs the jaumbs and ſuſtains the compartment of the chimney-piece. See the article CHIMNEY.

MANTLE, or MANTLING, in heraldry, that appearance of folding of cloth, flouriſhing or drapery, that is in any atchievement drawn about the coat of arms.

arms. It is ſuppoſed originally to be the repreſentation of a mantle, or military habit, worn by the antient cavaliers over their armour to preſerve it from ruſt; or, as others hold, a ſhort covering only worn over the helmet, which in after-times was lengthened, and made to hang from the helmet below the whole ſhield, as in plate CLXV. fig. 3.

The mantle is always ſaid in blazon, to be doubled, that is, lined throughout with one of the furs, as ermin, pean, viary, &c. See the article COAT.

MANTUA, the capital of a dutchy of the ſame name, in Italy, is ſituated in the middle of a lake, formed by the river Mincio, but has a communication with the continent by three cauſeways: eaſt long. 11° 15′, north lat. 45° 20′.

MANUCAPTIO, in law, a writ which lies for a man who being taken on ſuſpicion of felony, and offering ſufficient bail for his appearance, is refuſed to be admitted thereto by the ſheriff, or other perſon having power to let to mainprize.

MANUCODIATA, in ornithology, the bird of Paradiſe. See PARADISE.

MANUMISSION, in roman antiquity, the act of ſetting a ſlave at liberty, which was uſually performed before the prætor, who laid his wand, called vindicta, on the ſlave's head, and declared him free.

MANUFACTURER, one who works up a natural product into an artificial commodity.

Perſons employed in making up the woollen, linen, fuſtian, cotton, or iron manufactures, and all journeymen dyers, hot-preſſers, ſhoe-makers, glovers, thoſe employed in making of hats, or in any manufactures of ſilk, mohair, fur, hemp, flax, leather, or of any mixed materials, who ſhall leſſen the value, embezzle or purloin any materials with which they are intruſted, on being convicted by the oath of one witneſs, or confeſſion before a juſtice of peace, are to forfeit double the value of the damages ſuſtained, with coſts: and in caſe immediate payment be neglected, the juſtice is to commit the offender to the houſe of correction to be whipped, and to ſuffer hard labour for a term not exceeding fourteen days. and on further conviction for embezzling any of the materials, whether they be, or be not made up, the perſons are to forfeit four times their value, with coſts. And if payment with coſts be neglected, they are to be committed to the houſe of correction, to hard labour, for a time not exceeding three months, nor leſs than one, and to be whipped in the market-town, at the market-place, or croſs, once or oftener. And if any perſon buy, or take by way of gift, pawn, or ſale, any materials, knowing the ſame to be embezzled, he is to ſuffer the ſame forfeiture, as the perſon purloining them; all which forfeitures, are by 13 Geo. II. to be applied, one half to the party injured, and the other to the poor of the pariſh. But any one aggrieved, may appeal to the general or quarter-ſeſſions. If any perſon intruſted with materials to manufacture, ſhall not uſe them, and ſhall delay, for twenty days after ſuch materials ſhall be manufactured, to return (if required by the owner) ſo much as ſhall not be uſed, ſuch neglect will be deemed an embezzling. And if any perſon who ſhall work up any of the manufactures for one maſter, ſhall neglect to finiſh them by procuring himſelf to be retained by another, before the work ſhall be completed, he ſhall be ſent to hard labour, not exceeding one month.

MANURE, any thing uſed for fattening and improving land.

There are various kinds of manure uſed in different parts of England, for enriching the ſeveral ſoils, ſome of which have been already mentioned under the articles dung, chalk, lime, &c. which ſee: but there are others that might be uſed on many lands with equal ſucceſs.

All ſorts of marl and clay, ſpread over gravelly and ſandy land, are of vaſt advantage to it, by making it more ſolid and tenacious, as all kinds of ſand are to thoſe ſoils that conſiſt of a ſtiff loam or clay. Theſe kinds of manure are of laſting advantage. See the article SAND.

Tanner's bark, laid in a heap, and rotted, is alſo an excellent manure, eſpecially for ſtiff cold land, and one load of it will improve the ground more, and laſt longer than two loads of the richeſt dung: when this manure is laid on graſs, it ſhould be done ſoon after Michaelmas, that the winter rains may waſh it into the earth: and where it is uſed for corn-land, it ſhould be ſpread on the ſurface before the laſt plowing, that it may be turned down for the fibres of the corn to reach it in the ſpring. Rotten vegetables of moſt ſorts, alſo greatly enrich land, ſo that where other manure is ſcarce, theſe may be uſed with great ſucceſs: thus the weeds of ponds, lakes, and

and ditches, being dragged out juſt as they began to flower, and laid on heaps to rot, will make excellent manure: but it is to be obſerved, that in rotting theſe vegetables, it will be proper to mix ſome earth, mud, or any other ſuch like ſubſtance with them, to prevent their taking fire in their fermentation; it will alſo be proper to cover the heaps with earth, mud, or dung, to detain the ſalts, otherwiſe many of the finer parts will evaporate in fermenting. The refuſe of kitchen-gardens, when laid on heaps and rotted, will alſo afford good manure for corn-land: and alſo fern mowed down while it is green and tender, and laid on heaps to rot, will make excellent manure; and by frequently mowing it, this troubleſome plant will be deſtroyed. The aſhes of all kinds of vegetables are alſo good manure for land, ſo that where the ground is over-run with buſhes, brambles, &c. if they are grubbed up in ſummer, ſpread abroad to dry, and then conſumed to aſhes, and ſpread over the land, they will greatly improve it. Rotten wood, and ſaw-duſt, when rotted, are a very good manure for ſtrong land, as are alſo bones, horns, ſhells, woollen rags, &c. and whatever ſerves to looſen its parts.

MANUSCRIPT, in matters of literature, denotes a written book, in contradiſtinction to a printed one. See Book.

MANWORTH, in law, the price antiently ſet upon a man's life, which was paid to the lord for killing his villain.

MAP, a plain figure, repreſenting the ſurface of the earth, or a part thereof, according to the laws of perſpective. See the article Perspective.

In maps, theſe three things are eſſentially requiſite. 1. That all places have the ſame ſituation and diſtance from the great circles therein, as on the globe, to ſhew their parallels, longitudes, zones, climates, and other celeſtial appearances. 2. That their magnitudes be proportionable to their real magnitudes on the globe. 3. That all places have the ſame ſituation, bearing and diſtance, as on the earth itſelf.

The true chart performs the firſt and laſt of theſe very exactly, but fails extravagantly in the ſecond; and, indeed, no kind of projection yet found can exhibit more than two of them at once, by reaſon of the great difference between a plane and convex ſuperficies.

Maps are not always to be uſed as they lie before us, for ſometimes any part is uppermoſt; but, generally, the top is the north part, the bottom the ſouth, the right hand the eaſt, and the left hand the weſt, and marked with theſe words, or latin ones of the ſame import. There is alſo inſcribed a compaſs, pointing to all the quarters of the world, the north one being marked with a flower de luce.

The degrees of longitude are always numbered at top and bottom, and the degrees of latitude on the eaſt and weſt ſides. In all right-lined, and general circular maps, except thoſe of Wright's Projection, the degrees of latitude on the ſides are of an equal breadth; and in all circular and right-lined maps, except the ſaid Wright's, and the plain charts, the degrees of longitude are unequal.

In general maps, the circles correſponding to thoſe in the heavens are inſcribed, *viz.* the equator is expreſſed by a ſtraight eaſt and weſt line; and the firſt meridian, the polar circles, the tropics, and the other meridians and parallels, which are drawn at every five or ten degrees, interſect each other at right angles.

In ſeveral maps there are three ſorts of ſcales of miles, according to the various computations in different parts of the ſame country, *viz.* greater, leſſer and mean; beſides which, there are often affixed ſcales of other country-meaſures, as Dutch, French, Italian, &c.

As for other matters, regarding maps in general, the characters uſed to denote cities, rivers, roads, boundaries, and the like, they are uſually explained in the maps themſelves. We ſhall therefore proceed to ſhew the ſeveral methods of conſtructing the geographical maps in order: and firſt of the

Stereographic projection of Maps upon the plane of the equator, the eye being ſuppoſed placed in one of the poles. To do this proceed thus: from P, the pole, (plate CLXVII. fig. 1. n° 1.) draw a circle A B C D, of what circumference you pleaſe, to repreſent the equator, which croſs with two diameters A C, B D, dividing it into four quadrants, then ſubdivide each of theſe into nine, and theſe again into ten more, if the largeneſs will admit; and from D, the point of interſection of the firſt meridian B D, number every tenth degree with figures, both on the right hand and on the left, till they meet in the oppoſite point B 180; ſo will the map be divided into eaſt and weſt longitude. Then from the pole draw right

right lines to every such tenth degree in the equator, as is done in the quadrant D C; and these will represent the meridians, and the figures will shew the longitude.

To delineate the parallels of latitude, from B draw lines to every tenth degree in the quadrant A D; and where they intersect the diameter P A, through those points must circles be described from the center P, and then numbered from the equator towards the pole with 10, 20, 30, *&c.* Thus you have the meridians and parallels projected; and since the polar circles and tropics are only parallels, at a certain distance from the pole and equator, *viz.* 23° 30′; therefore set off 23° 30′, on the equator from D to E, as also from C to F; then through the points H and I, where the lines B E and B F intersect A C, describe double circles to distinguish them from other parallels. So shall P H represent the arctic circle, and P I the tropic of cancer. The lineaments of your map being thus projected, places may be inserted by help of a table of latitudes and longitudes, as represented *ibid.* n° 2. But in these maps, the mutual bearings and distances of places cannot be determined; also countries near the equator take up more room than proportionably they should.

Orthographic projection of MAPS upon the plane of the equator, wherein the eye is supposed to be at an infinite distance in the axis, two hundred semi-diameters at least; by which means the places about the pole, which may be discerned at any distance, will have a larger projection than those nearer the equator; just the reverse of what happened in the former projection.

In this projection, the equator must be drawn and divided, and meridians delineated in the same manner as taught above; then to describe the parallels proceed thus: from either side of the first meridian A P (plate CLXVII. fig. 2, n° 1.) draw right lines through the corresponding degrees, or every tenth degree of the quadrants A B, A D, parallel to the diameter B D; and through the points where these cut the meridian A P, draw circles representing the parallels, numbering them with 10, 20, 30, *&c.* from A to the pole P, to shew the degrees of latitude. To delineate the polar circles and tropics, set off from B to G, and from D to H 23° 30′; as also from A to I, and from A to K; and drawing lines between each, through the points of intersection of the first meridian A P, draw circles: thus P L will represent the polar circles, and P M the tropic of cancer. The ecliptic may be projected, and places laid down in the same manner as above; *ibid.* n° 2. This kind of the equatorial projection, shews the true decrease of the degrees of the equinoctial, or of longitude, in every parallel of latitude: the circumpolar regions may be delineated better in this than in the former projection; and so may Tartary, and the north parts of Europe, as Sweden, Norway and Muscovy.

But besides the inconveniencies, already mentioned, attending these two kinds of projection, there is no bringing all the places in the eastern or western hemisphere into less than two hemispheres, so as to express Europe, Asia and Africa, or America by itself, in one map. Geographers have therefore invented another way, somewhat more difficult indeed, but much more natural and useful, *viz.*

Stereographic projection of MAPS, upon the plane of the first meridian, wherein you must conceive the eye to be situated in that point of the equator, which is cut by the meridian 90° distant from the first meridian. In this projection the equator is a right line, as is also the meridian 90° distant from the prime one, and cutting it in the point of the eye's position: but the other meridians, and all the parallels, are arches of circles, and the ecliptic an ellipsis.

The method is this: describe the circle N E S W, (plate CLXVII. fig. 3.) representing the first meridian; cross it with two diameters at right angles, and W C E shall represent the equator, W the west part, and E the east; and the other diameter N G S will be the meridian, 90° distant from the first, N representing the north and S the south pole, and C the point where the eye is supposed to be.

To delineate the meridians, proceed thus: from N draw lines through each tenth degree, or each degree, if you think fit, of the quadrants W S or S E, which shall cut the quadrant of the equator W C in F, G, H, I, K, L, O, P; or, to avoid scores in your paper, make a point in the line where the side of the ruler cuts it. You need only divide one quadrant, because the divisions in it may be transferred into the lines C N, C E and C S, which will save the trouble of their particular divisions. Thus are the points in the equator, through

through which the meridians are to pass; as, also, those points in the perpendicular meridian, determining the ambit of the parallels, found out. The centers of all those meridians, whose distance from the first meridian, NWSE, does not exceed 45°, may be found out in the line CE, reckoning every second degree from the point C, for the centers of each degree from the point W. By the same proportion, we must take every twentieth degree, or point, from C, in the line CE, for centers to each tenth degree or point, from W, in the line WC: therefore Q will be the center of F, R of G, T of H, and V of I. But because the centers of the meridians, exceeding 45°, lie without the circumference of the first meridian, in the line CE extended; therefore, laying the ruler upon N, and every second degree, or, according to the projection upon every twentieth degree of the quadrant NE, make points in the extended line CE, which shall be the centers of all the other meridians where the edge of the ruler cuts it. Thus X will be the center of K, the meridian 50° distant from the primitive, and so on. And, in the like manner, may the meridians be described through the points in the line CE, by transferring the center-points of CE to CW continued.

The points for the projection of the parallels being already marked in the lines CN and CS, to find the centers of these points, erect a perpendicular at E, as *ab*; and from C, through each tenth degree of the quadrant NE, draw secant lines to cut the said perpendicular in *c*, *d*, *e*, *f*, &c. Then take the distance C*c* in your compasses, and transfer it upon the line CN, continued, from C to 1, which will be the center to the parallel *b* 80 *b*; C*d* transferred to C2 will give the center of the parallel *i* 70 *i*; C 3 = C*e* will be the center of *k* 60 *k*; and so on for the rest of the parallels.

To project the tropics and polar circles, set off, on each side the equator and poles, 23° 30′; then draw a secant from C, through these points, and transfer the point of intersection with the tangent line, as before, for the centers of those circles.

The construction of the parallels of the other hemisphere is performed in the same manner, *viz.* by transferring the centers found by the intersection of the secants with the tangents, to the line CS, continued.

There are two ways of projecting the ecliptic: for supposing C to be the first point of aries, and the eye to be in the vertical colure, it will be represented by a right line, drawn from the beginning of cancer B, through the beginning of aries C, to the beginning of capricorn M; which being graduated like the equator, the degrees of each sign are to be marked upon it. To do this, cross the ecliptic BM with a line at right angles, drawn from the opposite points of the polar circles in the meridian, Z, D; divide the quadrant BD into nine equal parts, each containing 10°; and laying a ruler upon Z, and upon each division of the quadrant BD, cut the line BM as you did the equator. But all this trouble may be spared, by transferring the divisions of the equator upon the ecliptic BM.

The other way of projecting the ecliptic, where the eye is supposed to be in the solsticial colure, is the same as in all maps of the hemispheres, where it cuts the points of the intersection of the first meridian and equator, at W and E; and the third point is that wherein the tropic BAY cuts the meridian NCS at A.

The construction is now ready for inserting the places in the maps, which may be done by the help of a table of longitudes and latitudes, as in the former methods.

The advantages of this projection are these: 1. It very agreeably represents the hemisphere intercepted between the two poles, with all the parts entire. 2. It shews the longitudes, latitudes and distances of places from all the great circles, exactly as on the globe itself.

Its defects are also two. 1. That the degrees of the equator, meridians and parallels, are unequal, except those of the first meridian, encreasing gradually the nearer they approach to the first or prime meridian; and consequently the parts about C are less, and those about A and C greater than they ought: and, in the same manner, the places about the poles bear an unequal proportion to those nearer the equator. 2. The course and distance between places, are neither with ease or exactness found in this projection.

If you would project a map of any particular portion of the earth, less than an hemisphere, you must make the projection proportionable to the extent of the map you intend to draw, and then cut out so much of it as is terminated by the greatest degree of longitude and latitude of the country to be projected. For example,

ample, suppose you would draw a map of Europe, according to this construction, which being laid down as directed above, through the points where the parallels of the greater and lesser latitude of Europe, *viz.* 72° and 34°, cut N C, draw lines parallel to the equator: and because, in the common maps, Europe includes 93° of longitude, therefore set off, *viz.* 46° 30′ from *n* to *g* and from *n* to *p*, and draw $gp = 93°$, the extent of Europe in longitude; then erect perpendiculars on the points *g* and *p*, to square your map; or, to save this trouble, set off *ng* from *q* to *r*, and from *q* to *t*, and cut out your map accordingly. However, it is best to allow a little more room in separating your map from the rest of the projection to express the situation thereof in respect of other countries.

Orthographic projection of MAPS on the plane of the meridian, in which the parallels of latitude are all right lines, and all the meridians, except the first, semi-ellipses; which construction is formed by supposing perpendiculars to fall from all points of each hemisphere on the plane of the first meridian.

Thus let NESW, (pl. CLXVIII. fig. 1.) the meridian, be divided, as in the former method, into four quadrants, and each quadrant into 9 or 90 equal parts or degrees; from each tenth degree of the quadrants N W and W S, draw lines to each corresponding tenth degree in the quadrants NE and E S, parallel to the equator WE, and these will be the parallels of latitude: and having numbered each parallel on the first meridian, and in G N and C S, transfer the intersections of these parallels with CN or C S into CW and C E, which will give the points in the equator through which the meridians must pass; and number these from W towards E, for degrees of longitude.

Then, since the meridians are semi-ellipses, you may describe them through the given points, *viz.* the two poles and the divisions of the equator W E, with elliptical compasses; or, by help of a sector, you may find the points in each parallel of latitude, through which the ellipses may be formed. The ecliptic, in this projection, will be represented by an elliptical or straight line, in the same manner as in the former method.

The maps of this construction have this advantage above the preceding methods, that they exhibit the true proportional decrease of the degrees of the equator in each parallel; but this advantage is counter-balanced by a great inconvenience, *viz.* the too great contraction of the meridians the nearer they lie to the first, which makes this projection unfit for general maps; Africa being the only quarter of the globe that would nearly retain its due figure and dimensions.

Stereographic projection of MAPS, upon the plane of the horizon, the eye being supposed in the zenith for the upper hemisphere, and in the nadir for the lower one. The common method of construction is this: suppose it were required to describe an horizontal projection for the city of London, in latitude 51° 32′; from L or Z, (plate CLXVIII. fig. 2.) the zenith and London being here the same, describe the circle N E S W of what extent you please; to represent the horizon, quarter it, and divide each quarter into 90°; or, to avoid confusion, divide only one quadrant N W or W S; draw the diameter N S, which let be the first meridian, then will W E be the prime vertical, or azimuth of east and west. Next take 51° 32′ from the divided quadrant NW, and set it off from N to A; then draw a line from W to A, and where the ruler cuts N S make a point, which shall represent the arctic pole P. Thirdly, take the distance of the arch of any of the quadrants, as N E, and set it off from A to B; and where the line WB cuts the diameter NS, that point Q will be the point of the intersection of the meridian with the equator. Fourthly, divide the semicircle NAEBS, from B, into degrees, the same in proportion to those of the quadrant N W; and from W to each, or each tenth degree, lay a ruler, and mark where it cuts the line N S, for there will be the points of the intersection of the parallels with the first meridian, which fall within the periphery of the projection. But if you would find the opposite point of each parallel, in order to delineate them easily on the projection, continue the division of the periphery from the equatorial point B, upon the quadrant N W, and draw lines as before through each point to cut the diameter N S continued; then describe circles through the points of equal degrees from the pole P, through 80, 70, 60, *&c.* in the line P S, and 80, 70, 60, *&c.* in the line P N, extended. Thus may all the parallels, tropics, and polar circles be projected.

In the construction of the meridians proceed thus: first, through the points W, P, E, draw a circle, the half of which is CPD, and delineate thereon the meridian

pro-

projection, by dividing it into 360°; then drawing lines from P to every degree, or tenth degree : and, lastly, describing circles from the centers found in the line CD, continued at both ends, through the division in the diameter WE, and the poles, in the same manner as directed in the stereographic projection upon the meridian, the parallels excepted, which must not be drawn. In describing the meridians, observe to draw each through the pole to touch the horizon, which will be the meridians north of the pole. Thus, when you describe the meridian FP, describe at the same time FPG; and the same holds of all the rest.

When you have proceeded thus far, describe a circle round the horizon pretty close, to contain the degrees of graduation, which must be made between the meridians, and not the parallels, each into ten parts or degrees, to shew the longitudes of places. The latitude must be graduated on the first meridian NS, and numbered from the equator towards either pole, and from the pole backward, towards N. This done, draw a circle with this again, wide enough to hold the figures belonging to the numbered degrees. Lastly, describe two more circles, the first near the former, and divide the quadrants into eight equal parts each, or thirty-two in all, to represent the points of the compass, and shew the bearings of places in respect of London the center. The outward graduated circles supply the place of azimuths, to draw which would occasion confusion in the scheme; for if a central rule be fixed upon a pivot in the center, or place representing London, and graduated with the same divisions as ZN, by moving it about to any place, we may easily discover not only the bearing but the distance of that place from London.

All these circles are expressed in the lower figure, in which so much of the earth is described as is contained within the horizon of London, as a specimen of the nature and use of this projection. Thus your projection being completed, it is easy to insert the places, according to their latitudes and longitudes.

Horizontal projection of MAPS, with azimuth lines. Those who are unwilling to take the trouble of laying down the former projection, and are content to know the bearings and distances of places from the center, without the longitude or latitude, may divide the circle NESW (plate CLXVIII. fig. 3.) into degrees and points of the compass; where NS represents the meridian, WE the east and west line, and Z the zenith, or place in the center. This done, you may put London, or any other place in the center; and by the help of the scale of equal parts ZA, fixed in the center, the bearings and distances of places may be laid down from the globe or maps.

Mercator's or Wright's projection of MAPS. The principles upon which this admirable contrivance is founded, have been already explained under the article CHART. Now to apply this method to the projection of maps, draw the line AB, (plate CLXIX. fig. 1.) and divide it into as many degrees as your map is to contain in longitude, suppose 90°. At the extremities A and B raise perpendiculars, to which draw parallel lines at every single, fifth, or tenth degree of the equator for the meridians; as in the figure where they are drawn at every tenth degree. This done, put one foot of the compasses in the point A, and extending the other to the point in the first meridian in the equator G; or, for greater exactness, to some more distant point, as B 90°. Describe the quadrant FB, which divide into nine equal parts, and draw lines from A to each point of the division; or, to avoid scoring the paper, only mark where a ruler cuts the first meridian GH, at every tenth degree's distance. Lastly, because the distances of the parallels from one another are marked, by this means, in the line GH, you must transfer them from that line to the side lines AC, BD, after the following manner. 1. Set one foot of the compasses in A, and extending the other to the first point above G, marked 1, transfer this distance, *viz.* A 1, to the lines AC, BD, and draw a line parallel to the equator AB, for the tenth parallel. 2. Next transfer the distance A 2 into the lines AC, BD, from the tenth parallel to the twentieth, which is to be drawn. 3. In the same manner, the distances A 3, A 4, A 5, &c. laid off upon the lines AC, BD, from the immediately preceding parallels, *viz.* 20, 30, 40, &c. will successively point out where the parallels, 30, 40, 50, &c. are to be drawn.

This is the geometrical projection, which may also be laid down by means of a scale or table of meridional parts, by the line of secants, &c.

Though this projection be most true, yet hath

hath it this diſadvantage, of extorting the figure, magnitude and proportion of countries; we ſhall therefore add a more exact method of projecting particular maps, wherein the ſquares are ſo projected as to form equal diagonals throughout.

A new, eaſy, and exact method of projecting particular MAPS. Suppoſe you would draw a map of ſome part of the earth, containing 6° of latitude, *viz.* from 39° to 45°, let the longitude be what it will. 1. Draw the line E F, (plate CLXIX. fig. 2.) and in its middle raiſe the perpendicular D C, which divide into ſix equal parts, or degrees of latitude; and through C, draw a line parallel to E F. 2. Divide a degree into ten, or if large enough to admit it, into ſixty equal parts; and in the table for decreaſing longitude, find the content of a degree of longitude in the latitude of 39°, *viz.* 46.62 miles. 3. From the degree ſo divided, take the parts 46.62; divide that diſtance, and from D ſet off one half to E, and the other half to F. 4. Find the content of a degree in latitude 45°, *viz.* 42.43 miles; take that diſtance from the ſcale of the degree; divide it; and from the point C lay one half to I, and the other half to K. 5. Draw ſtraight lines from I to E and from K to F; divide them in like parts with C D, and through thoſe marks draw parallel lines.

Thus I K F E is a projection for one degree of longitude, including ſix degrees of latitude; which may be transferred upon the paper, as often as there is occaſion, by the following method.

1. If the compaſſes be large enough, or the projection will admit it, take the diſtance from E to K, or from F to I, and ſetting one foot firſt in E and then in F, deſcribe the arches L and M. In like manner ſet one foot firſt in I and then in K, and with the ſame extent draw the arches N and O: take the diſtance with another pair of compaſſes, between E and F, and ſet it off from E to N, and from F to O: likewiſe ſet the diſtance between I and K, from I to L, and from K to M; draw lines between L and N, and M and O; divide them into degrees, and draw parallels from thoſe points to the correſponding points in the meridians I E and K F. And, after the ſame manner, may meridians and parallels be drawn, to as many degrees of longitude as your map contains.

2. If the map be very large, ſo that the compaſſes cannot extend to the furtheſt degree, or from F to I, then you may draw one or more diagonals, as you can conveniently, at once; and then proceed to draw the reſt. Thus, when you have laid down the ſquares P G E N (*ibid.*) and H Q O F, in the ſame manner as directed above, go on to draw L I G P and K M Q H, by the ſame method.

In this projection, the diagonals being all equal, places lying in the remoteſt longitudes or diagonals, are as truly exhibited as thoſe near the middle, and conſequently their diſtances conformable to one common meaſure; ſo that the compaſſes, extended between any two places, and applied to the ſcale, give the diſtance without more ado. The bearings too will be very conſpicuous by means of a compaſs drawn on a corner or ſide of the map.

The ſcale on the ſides, is that by which the diſtances are meaſured; but it muſt be graduated on one of the meridians, and not on the out lines of the map, as is commonly done.

Printed maps, on being imported from abroad, pay a duty of 15 s. $4\frac{80}{100}$ d. per ream; and draw back, on exportation, 13 s. 6 d. and, if in frames, for each map 1 s. $2\frac{36\frac{1}{2}}{100}$ d. the drawback being 1 s. $\frac{93\frac{3}{4}}{100}$ d.

MAPLE, *acer*, in botany, a genus of the octandria monogynia, claſs of plants, the flower of which is compoſed of five oval petals; the fruit conſiſts of a number of capſules, which grow together at the baſe; and are compreſſed, roundiſh, and each terminated by a very large membranaceous ala; the ſeeds are ſingle and roundiſh.

MAPPARIUS, in roman antiquity, the officer, who gave the ſignal to the gladiators, to begin fighting; which he did by throwing an handkerchief, that he had received from the emperor or other magiſtrate.

MARACAIBO, a city and port-town in the territory of Venezuela, ſituated on the weſt ſide of the lake of Maracaibo, in Terra Firma, in South America: weſt long. 70°, and north lat. 10° 45′.

MARANA, or MARAGNA, a city of the province of Romania, in european Turky: eaſt long. 26°, and north lat. 40° 36′.

MARANO, a town of the province of Friuli, in the territory of Venice, thirty miles north-eaſt of that capital.

MARANTA, in botany, a genus of the monandria

monandria monogynia clafs of plants, with a monopetalous ringent flower, the tube of which is oblong, compreffed, crooked, and oblique, and its limb fexifid; the fruit is a roundifh capfule, fomewhat obfcurely trigonal, containing a fingle, hard, and rugofe feed.

MARASMUS, among phyficians, denotes an atrophy or confumption, in its laft and moft deplorable ftage. See the article CONSUMPTION.

MARAVEDI, a little fpanifh copper-coin. See the article COIN.

MARBLE, *marmor*, in natural hiftory, a genus of foffils; being bright and beautiful ftones, compofed of fmall feparate concretions, moderately hard, not giving fire with fteel, fermenting with and foluble in acid menftrua, and calcining in a flight fire.

The colours of marbles being a very obvious and ftriking character, they are arranged according to them, in the following divifions. 1. Of the white plain marbles there are two forts; the parian marble of the antients, and ftatuary marble of the moderns, an extremely bright and elegant marble; and the carrara marble, a very fine marble, more compact and clofe than the former, but lefs bright. 2. Of the plain yellowifh marbles there is only one fort, which is a hard, pale yellow, and gloffy marble, found in many parts of Italy. 3. Of the bluifh and black marbles there are a great many fpecies, as the chian marble, bafaltes, *&c.* 4. Of the plain green marbles there is only one kind, the lacedemonian marble of the antients. 5. The pale coloured or whitifh brown, commonly called darby-marble. 6. The green marbles with fhells. 7. The black coralloide marble, with and without fhells. 8. Of the white variegated marbles there are a great many fpecies, variegated with purple, brown, red, blue, *&c.* 9. Of the brown variegated marbles there are likewife feveral forts, fome with red veins, others with white, black, or brown veins. 10. Of the yellow veined and variegated marbles, fome are veined with purple, and others with blue. 11. Of the black variegated marbles, fome are veined with white, and others with blue, yellow, red, *&c.* 12. The green variegated marbles are likewife diftinguifhed by the colour of their veins. 13. The grey fpotted marbles are variegated, fome with black, and others with green fpots. 14. The red variegated marble is the brocatello of the Italians, with white and gold veins.

Colouring of MARBLE. The colouring of marbles is a nice art, and in order to fucceed in it, the pieces of marble, on which the experiments are tried, muft be well polifhed, and clear from the leaft fpot or vein. The harder the marble is, the better it will bear the heat neceffary in the operation; therefore alabafter, and the common foft, white marble, are very improper to perform thefe operations upon.

Heat is always neceffary for the opening the pores of the marble, fo as to render it fit to receive the colours; but it muft never be made red hot, for then the texture of the marble itfelf is injured, and the colours are burnt, and lofe their beauty. Too fmall a degree of heat is as bad as too great; for, in this cafe, though the marble receive the colour, it will not be fixed in it, nor ftrike deep enough. Some colours will ftrike, even cold, but they are never fo well funk in as when a juft degree of heat is ufed. The proper degree is that which, without making the marble red, will make the liquor boil upon its furface. The menftruums ufed to ftrike in the colours muft be varied according to the nature of the colour to be ufed. A lixivium made with horfe's or dog's urine, with four parts quick-lime, and one part pot-afhes, is excellent for fome colours; common lye of wood-afhes does very well for others: for fome, fpirit of wine is beft; and finally, for others, oily liquors, or common white-wine.

The colours which have been found to fucceed beft with the peculiar menftruums, are thefe: ftone blue diffolved in fix times the quantity of fpirit of wine, or of the urinous lixivium; and that colour which the painters call litmoufe, diffolved in common lye of wood-afhes. An extract of faffron, and that colour made of buckthorn-berries, and called by the painters fap-green, both fucceed well diffolved in urine and quick lime, and tolerably well in fpirit of wine. Vermillion, and a fine powder of cochineal, fucceed alfo very well in the fame liquors. Dragon's blood fucceeds very well in fpirit of wine, as does alfo a tincture of logwood in the fame fpirit. Alkanet-root gives a fine colour, but the only menftruum to be ufed for this is oil of turpentine; for neither fpirit of wine, nor any lixivium, will do with it. There is another kind of fanguis draconis, called dragon's

blood

blood in tears, which, mixed with urine alone, gives a very elegant colour. Besides these mixtures of colours and menstruums, there are some colours which are to be laid on dry and unmixed. These are dragon's blood, of the purest kind, for a red; gamboge for a yellow; green wax for a green; common brimstone, pitch and turpentine for a brown colour. The marble, for these experiments, must be made considerably hot, and then the colours are to be rubbed on dry in the lump. Some of these colours, when once given, remain immutable; others are easily changed or destroyed. Thus the red colour given by dragon's blood, or by a decoction of logwood, will be wholly taken away by oil of tartar, and the polish of the marble not hurt by it.

A fine gold-colour is given in the following manner: take crude sal armoniac, vitriol and verdegrease, of each equal quantities; white vitriol succeeds best, and all must be thoroughly mixed in fine powder.

The staining of marble to all the degrees of red or yellow, by solutions of dragon's blood or gamboge, may be done by reducing these gums to powder, and grinding them, with the spirit of wine, in a glass mortar; but for smaller atempts, no method is so good as the mixing a little of either of these powders with spirit of wine in a silver spoon, and holding it over burning charcoal. By this means a fine tincture will be extracted, and with a pencil dipped in this, the finest traces may be made on the marble, while cold, which, on the heating it afterwards, either on sand, or in a baker's oven, will all sink very deep, and remain perfectly distinct in the stone. It is very easy to make the ground colour of the marble red or yellow by this means, and leave white veins in it. This is to be done by covering the places where the whiteness is to remain with some white paint, or even with two or three doubles only of paper, either of which will prevent the colour from penetrating in that part. All the degrees of red are to be given to marble by means of this gum alone; a slight tincture of it, without the assistance of heat to the marble, gives only a pale flesh colour, but the stronger tinctures give it yet deeper; to this the assistance of heat adds yet greatly; and finally, the addition of a little pitch to the tincture gives it a tendency to blackness, or any degree of deep red that is desired. A blue colour may be given also to marble by dissolving turnsol in a lixivium of lime and urine, or in the volatile spirit of urine; but this has always a tendency to purple, whether made by the one or the other of these ways. A better blue, and used in an easier manner, is furnished by the canary-turnsol, a substance well known among the dyers: this needs only to be dissolved in water, and drawn on the place with a pencil; this penetrates very deep into the marble, and the colour may be increased by drawing the pencil wetted afresh several times over the same lines. This colour is subject to spread and diffuse itself irregularly; but it may be kept in regular bounds, by circumscribing its lines with beds of wax, or any other such substance.

Polishing of MARBLES is performed by first rubbing them well with a free-stone, or sand, till the strokes of the axe are worn off, then with pumice-stone, and afterwards with emery.

Arundel-MARBLES, antient marbles with a chronicle of the city of Athens inscribed on them, many years before our Saviour's birth; presented to the university of Oxford by Thomas earl of Arundel, whence the name.

MARBLING, in general, the painting any thing with veins and clouds, so as to represent those of marble.

Marbling of books or paper is performed thus: dissolve four ounces of gum arabic into two quarts of fair water; then provide several colours mixed with water in pots or shells, and with pencils peculiar to each colour, sprinkle them by way of intermixture upon the gum-water, which must be put into a trough, or some broad vessel; then with a stick curl them, or draw them out in streaks, to as much variety as may be done. Having done this, hold your book or books close together, and only dip the edges in, on the top of the water and colours, very lightly; which done, take them off, and the plain impression of the colours in mixture will be upon the leaves; doing as well the ends as the front of the book in the like manner.

After the same manner you may make marbled paper, by dipping it on the flat, as also linen cloth, &c.

Marbling a book on the covers is performed by forming clouds with aqua fortis, or spirit of vitriol mixed with ink, and

and afterwards glazing the covers. See the article BOOK-BINDING.

MARCASITES, *marchasitæ*, in natural history, are defined to be compound inflammable metallic bodies, of a hard and solid substance, of an obscurely and irregularly foliaceous structure, of a bright glittering appearance, naturally constituting whole strata, though sometimes found in detached masses; very freely giving fire with steel; not fermenting with acid menstruums; and when put into the fire, yielding a blue sulphureous flame, and afterwards calcining into a purple powder. There are only three known species of this genus: 1. The silver-coloured marcasite, found in vast abundance in lead and tin-mines. 2. The gold coloured marcasite. 3. The heavy pale-white marcasite.

Marcasites were at first supposed to be almost all pure gold or silver, according to their colour; but experience has shewn, that if they contain any metal at all, no method has hitherto been found of working them to advantage. In Germany, indeed, they extract sulphur and vitriol from the silver marcasite, which two substances are always contained in it; and besides these, it has usually a quantity of arsenic. It has been recommended as a styptic, after being calcined; but as the arsenic may not be all carried off by that operation, its use as a medicine seems extremely dangerous.

MARCGRAVE, or MARGRAVE, a degree of honour in Germany answering to our marquis. See MARQUIS.

MARCGRAVIA, in botany, a genus of the polyandria-monogynia class of plants, the corolla whereof consists of a single petal, of a conico-oval figure; and its fruit is a globose berry, with a single cell, containing a great number of very small seeds.

MARCH, in chronology, the third month of the year, consisting of thirty-one days. See the articles MONTH and YEAR.

MARCHANTIA, in botany, a genus of the cryptogamia class of plants, the corolla of which is monopetalous, turbinated, and shorter than the cup; in the lower cavity of which there are contained several naked seeds, of a roundish but compressed figure.

MARCHE, a territory of Lyonois, in France, having Berry on the north, Burbonois and Auvergne on the east, Limosin on the south, and Poictou on the west.

MARCHE is also a town of Lorrain, subject to France: east longitude 5° 45′, north latitude 48° 10′.

MARCHIENNES, a town of the austrian Netherlands, on the confines of Namur, three miles west of Charleroy: east long. 4° 20′, north lat. 50° 26′.

MARCHPURG, a town of Germany, in the circle of Austria and dutchy of Stiria: west long. 15° 50′, north lat. 47°.

MARCIONITES, christian heretics in the IId century, thus denominated from their leader Marcion, who maintained, that there were two principles or Gods, a good and a bad one. Origen affirms, that he held there was a God of the jews, a God of the christians, and a God of the gentiles. It is said that he denied the resurrection of the body, condemned marriage, and taught that our Saviour, when he descended into hell, discharged Cain, the Sodomites, and other impious wretches out of that place of torment. He rejected all the Old Testament, and received only part of St. Luke's Gospel, and ten of St. Paul's Epistles, in the New.

MARCOSIANS, a sect of christian heretics in the IId century, so called from their leader Marcus, who represented the supreme God as consisting not of a trinity, but a quaternity, *viz.* the ineffable, silence, the father, and truth. He held two principles, denied the reality of Christ's sufferings, and the resurrection of the body, and had the same fancies concerning the æons as Valentinus. See the articles ÆON and VALENTINIANS.

The marcosians, it is said, made pretences to greater perfection than either St. Peter or St. Paul; and being persuaded that nothing could hinder their salvation, freely indulged themselves in the practice of vice.

MARDIKE, a port-town of french Flanders, four miles west of Dunkirk.

MARDIKERS, or TOPASSES, a mixed breed of Dutch, Portuguese, Indians, and other nations, incorporated with the Dutch at Batavia, in the East Indies.

MARE, the female of the horse-kind. See the article HORSE.

Such mares as are designed for breeding, ought to be as free from defects as possible, and should, no more than the stallions, have either moon-eyes, watery eyes, or bloodshot-eyes; they should have no splint, spavin, or curb, nor any natural imperfection, for the colts will take after them: but choice should be made of the best and ablest, the most high spirited, best coloured, and finest shaped; and

and the natural defects that may be in the stallion, should be amended in the mare, as well as that which is amiss in the mare should be amended in the stallion.

As for her age, she may be covered when three years old; but the most convenient time is after four, when she will nourish her colt best; and though she may breed till she is thirteen, yet she is not fit for it when she is past ten, for the colt of an old mare is commonly heavy. Before a mare is covered, she should be in the house about six weeks, during which time she should be well fed with good hay and oats well sifted; and in order to render her conception the more certain, near a quart of blood may be taken from each side of her neck, about five or six days before covering. Another method to bring a mare in season, and make her retain, is to give her, for the space of eight days before you bring her to the horse, about two quarts of hemp-seed in the morning, and as much at night; and if she refuses to eat it, to mingle it with a little bran or oats, or else to let her fast for a while: and if the stallion also eat of it, it will greatly contribute to generation.

Mares go with foal eleven months and as many days as they are years old, and therefore the properest time for covering them is in the beginning of June, that she may foal the May following, when there will be plenty of grass, which will afford the mares a great abundance of milk, for nourishing their foals: but a mare should never be covered while she is bringing up her foal, because the foal to which she is giving suck, as well as that in her belly, will be prejudiced by it, and she herself sooner spent. After covering, let her, for three weeks or a month, have the same diet as before, and be kept clean in the stable till the middle of May, with her feet well pared and thin shod: take her in again about the latter end of September, if not before, and keep her to the end of her foaling. If she cannot readily bring forth, hold her nostrils so as to stop her taking wind; and if that will not do, dissolve madder, to the quantity of a walnut, in a pint of ale, and give it her warm. In case she cannot void her secundine, or after-burden, boil two or three handfuls of fennel in running water, then put half a pint of that liquor into as much sack, or, for want thereof, into a pint of ale, with a fourth part of sallad oil, mixed together, and pour it lukewarm into her nostrils, holding them close for some time. Otherwise give her green wheat, or rye, the last of which is best.

If the mare has but little milk, boil as much as you can get from her, with the leaves of lavender and spike, and bathe the udder with it warm, till the knobs and knots are dissolved. She should now drink only white water, which is bran put into water; give her also sweet mashes; and a month after foaling let her have a mash with some brimstone or savin in it.

MARGA, Marle, in natural history. See the article Marle.

MARGARETTA, one of the largest of the Leeward-islands; it is about 50 miles long, and twenty four broad, and is situated sixty miles north of the continent of Paria, or New Andalusia, in South America: west long. 64°, and north lat. 11° 30′.

MARGARITA, the pearl, in natural history. See the article Pearl.

MARGATE, a port-town of Kent, in the isle of Thanet, 12 miles north of Deal.

MARGENTHEIM, or Mergentheim, a city of Germany, in the circle of Franconia: east long. 9° 40′, and north lat. 49° 32′.

MARIENBURG, a town of the french Netherlands, in the province of Hainalt, ten miles west of Charlemont.

Marienburg is also a town of polish Prussia, 20 miles south-east of Dantzic.

MARIGNAN, a city and port-town of Brazil, the capital of the captainship of Marignan, situated at the mouth of the river St. Mary: west longitude 44°, and south latitude 2° 15′.

MARINER, the same with sailor or seaman. See Sailors and Seamen.

MARINO, a city of Italy, in the dutchy of Urbino, the capital of the territory of Marino, a little state or commonwealth, situated on a mountain in the middle of the pope's territories: east long. 13° 30′, and north lat. 44°.

Marino is also a town of Italy, in the Campania of Rome, eight miles east of that city.

MARJORAM, *marjorana*, in botany, &c. See the article Marjorana.

MARITIME, something relating to, or bounded by the sea: thus, a maritime province, or country, is one bounded by the sea; and a maritime kingdom, or state, is one that makes a considerable figure, or is very powerful at sea. Hence, by maritime powers, among the european states,

ſtates, are underſtood Great Britain and Holland. See the articles NAVAL AFFAIRS, NAVIGATION, &c.

MARK, in commerce, a certain note which a merchant puts upon his goods, or upon the caſk, hogſhead, &c. that contains them, in order to diſtinguiſh them from others, ſuch as a grape, a crow's foot, a diamond, a croſs, an aſteriſk, &c. Some uſe one or other of theſe marks by themſelves; others join them with the initial letters of their own name, and others uſe the letters only.

St. MARK *the evangeliſt's day*, a feſtival of the chriſtian church, obſerved April 25.

St. MARK'S *Goſpel*, a canonical book of the New Teſtament, being one of the four Goſpels.

St Mark wrote his Goſpel at Rome, where he accompanied St. Peter, in the year of Chriſt 44. Tertullian and others pretend, that St. Mark was no more than an amanuenſis to St. Peter, who dictated this Goſpel to him; others affirm, that he wrote it after St. Peter's death. Nor are the learned leſs divided as to the language this Goſpel was wrote in; ſome affirming it was compoſed in greek, others in latin. Several of the antient heretics received only the Goſpel of St. Mark: others among the catholics rejected the twelve laſt verſes of this Goſpel. The Goſpel of St. Mark is properly an abridgment of that of St. Matthew.

Canons of St. MARK, a congregation of regular canons, founded at Mantua, by Albert Spinola a prieſt, towards the end of the XIIth century. Spinola made a rule for them, which was approved, corrected, and confirmed by ſeveral ſucceeding popes. About the year 1450, they were reformed, and followed only the rule of St. Auguſtine. This congregation having flouriſhed for the ſpace of four hundred years, declined by little and little, and is now become extinct.

Knights of St. MARK, an order of knighthood in the republic of Venice, under the protection of St. Mark the evangeliſt. The arms of the order are, gules, a lion winged, or, with this device, PAX TIBI MARCE EVANGELISTA. This order is never conferred but on thoſe who have done ſignal ſervice to the commonwealth.

MARK, or MARC, alſo denotes a weight uſed in ſeveral ſtates of Europe, and for ſeveral commodities, eſpecially gold and ſilver. In France, the mark is divided into 8 ounces, or 64 drachms, or 192 deniers or penny-weights, or 160 eſterlines, or 300 mailles, or 640 felins, or 4608 grains. In Holland the mark-weight is alſo called troy-weight, and is equal to that of France. When gold and ſilver are ſold by the mark, it is divided into 24 caracts. See the article CARACT.

MARK is alſo uſed among us for a money of account, and in ſome other countries for a coin.

The engliſh mark is two thirds of a pound ſterling, or 13 s. 4 d. and the ſcotch mark is of equal value in ſcotch money of account. The mark-lubs, or lubeck-mark, uſed at Hamburgh, is alſo a money of account, equal to one third of the rix-dollar, or to the french livre: each mark is divided into ſixteen ſols-lubs. Mark-lubs is alſo a daniſh coin equal to 16 ſols-lubs. Mark is alſo a copper and ſilver coin in Sweden. See COIN.

MARKET, a public place in a city or town, in which live cattle, proviſions, or other goods, are ſet to ſale; and alſo a privilege, either by grant or preſcription, by which a town is enabled to keep a market.

A market is leſs than a fair, and is commonly held once or twice a week. According to Bracton, one market ought to be diſtant from all others at leaſt ſix miles and a half and a third of a half: but no market is to be kept within ſeven miles of the city of London; but all butchers, victuallers, &c. may hire ſtalls and ſtandings in the fleſh-markets there, and ſell meat and other proviſions, four days in a week. Every perſon who has a market, is entitled to receive toll for the things ſold in it; and, by antient cuſtom, for things ſtanding in the market, though nothing be ſold: but by keeping a market in any other manner than it is granted, or extorting of toll or fees, where none are due, they may be forfeited.

MARKET-JEW, a market-town of Cornwal, ſituated on Mountſbay, ten miles eaſt of the Land's end.

MARLBRO, or MARLBOROUGH, a borough town of Wiltſhire, eighteen miles north of Saliſbury.

It ſends two members to parliament.

MARLBRO-FORT, an engliſh factory on the weſt coaſt of the iſland of Sumatra, three miles eaſt of Bencoolen: eaſt long. 101°, and ſouth lat. 4° 15'.

MARLE, *marga*, in natural hiſtory, is an earth but ſlightly coherent, not ductile, ſtiff, or viſcid while moiſt, moſt eaſily

diffufible in, and difunited by water, and by it reduced into a foft, loofe, incoherent mafs.

Among the different kinds of marle, there is one that has a place in the catalogues of the materia medica, which is known in the german fhops under the name of marga, or marla; this is fometimes white, and at others flefh-coloured: but the earth is the fame under either of thefe appearances. It is of a compact, fmooth, and fomewhat gloffy furface, and when fmall pieces of it are rubbed between the fingers, it very eafily moulders into a fine impalpable powder. This is efteemed as an aftringent, and is given as fuch in diarrhœas, dyfenteries, and hæmorrhages; the red kind is preferred for the laft intention; but the difference between this and the white is not worth regarding. The Germans alfo give it in fevers, in convulfions, and particularly in epileptic cafes, and in internal bruifes: but we are apt to believe, that too many virtues are afcribed to it.

Marle, ufed as a manure, is of very great fervice to lands, efpecially to fuch as are fandy and loofe: marls are of different qualities in the different counties of England, and are chiefly diftinguifhed by their colour; but the properties of any fort of marle are better judged of, by its purity, and by its diffolving in wet or froft; for if it is fat and tender, and will open the land it is laid on, it may be taken for granted that it will be beneficial to it. Some advife burning the marle before it is laid on the land, by which means one load will go as far as five. The quantity of marle ought to be in proportion to the depth of the earth; and over-marling has often proved of worfe confequence than under-marling, efpecially where the land is ftrong; but in fandy land there can be no danger in laying on a great quantity, or repeating it often. Marles do not improve lands the firft year fo much as they do afterwards.

MARLI, a town of France, ten miles north-weft of Paris, remarkable for a royal palace, and a very complex machine for raifing water.

This machine, if Mr. Bernouilli's computation be right, muft be a very bad one, fince, according to him, no lefs than $\frac{5}{5\frac{1}{6}}$ parts of its abfolute force is loft.

MARLOW, a borough-town of Buckinghamfhire, fifteen miles fouth of Ailefbury. It fends two members to parliament.

MARMALADE, a confection of plumbs, apricots, quinces, &c. boiled with fugar to a confiftence.

MARMOR, MARBLE. See MARBLE.

MARMORA, a little ifland of Turky, fituated in the fea of Marmora, to which it gives name, lying fixty miles fouth-weft of Conftantinople.

MARMOTTE, in zoology, the largeft animal of the mus or rat-kind, with a long naked tail and tawney body: it is near as big as a hare, and breeds only on the tops of mountains in Switzerland. Its feet are fomewhat like thofe of a bear. See plate CLXX. fig. 2.

MARNE, a confiderable river of France, which, rifing in the fouth-eaft of Champaign, falls into the river Seine, near Paris.

MARONITES, in church hiftory, a fect of chriftians near mount Libanus in Syria, who are in communion with the church of Rome, and have their patriarch, archbifhops, bifhops, &c.

MAROSCH, or MERISH, a great river, which, rifing in the Carpathian mountains, runs through Tranfilvania and Hungary, and falls into the river Teyfe at Segedin.

MARPURG, a city of Germany, forty miles north of Francfort: eaft long. 8°, 40′, and north lat. 50° 40′.

MARQUE, or *Letters of* MARQUE, in military affairs, are letters of reprifal, granting the fubjects of one prince or ftate liberty to make reprifals on thofe of another.

Letters of marque among us, are extraordinary commiffions granted by authority, for reparation to merchants, taken and defpoiled by ftrangers at fea; and reprifals is only the retaking, or taking of one thing for another.

In the profecution of thefe letters there muft be, 1. The oath of the perfon injured, or other fufficient proof, touching the injury fuftained. 2. A proof of due profecution for fatisfaction in a legal way. 3. The deferring or denial of juftice. 4. A complaint to his own prince or ftate. 5. A requifition of juftice made to the fupreme head of the ftate. After all which, letters of reprifal, under certain reftrictions, are iffued; but if the fupreme power think thefe letters of reprifal may affect the peace of the ftate, they are put off till a more convenient time.

For the diftribution of fuch prizes as are taken, in confequence of thefe letters of marque, fee the article PRIZE.

MARQUETRY, or INLAID-WORK, is a cu-

a curious work composed of several fine hard pieces of wood, of various colours, fastened in thin slices on a ground, and sometimes enriched with other matters, as silver, brass, tortoise-shell, and ivory; with these assistances the art is now capable of imitating any thing; whence it is by some called the art of painting in wood.

The ground on which the pieces are to be arranged and glued, is usually of well-dried oak or deal, and is composed of several pieces glued together, to prevent its warping. The wood to be used in marquetry is reduced into leaves, of the thickness of a line, or the twelfth part of an inch, and is either of its natural colour, or stained, or made black to form the shades by other methods: this some perform by putting it in sand heated very hot over the fire: others, by steeping it in lime water and sublimate; and others, in oil of sulphur. The wood being of the proper colours, the contours of the pieces are formed according to the parts of the design they are to represent: this is the most difficult part of marquetry, and that which requires the most patience and attention.

The two chief instruments used in this work, are a saw and a wooden vice, which has one of its chaps fixed, and the other moveable, which is open and shut by the foot, by means of a cord fastened to a treddle. See plate CLXX. fig. 4.

The leaves to be formed, of which there are frequently three, four, or more joined together, are, after they have been glued on the outermost part of the design, whose profile they are to follow, put within the chaps of the vice; then the workman pressing the treddle, and thus holding fast the piece, with his saw runs over all the out-lines of his design. By thus joining or forming three or four pieces together, not only time is saved, but also the matter is the better enabled to sustain the effort of the saw, which, how fine soever it may be, and how slightly soever it may be conducted by the workman, except this precaution were taken, would be apt to raise splinters, and ruin the beauty of the work. All the pieces having been thus formed by the saw, and marked, in order to their being known again, each is vaneered, or fastened in its place, on the common ground, with the best english glue; and this being done, the whole is set in a press to dry, planed over, and polished with the skin of the sea-dog, wax, and shave-grass, as in simple vaneering, and the fine branches and more delicate parts of the figures are touched up and finished with a graver.

MARQUIS, a title of honour, next in dignity to that of duke, first given to those who commanded the marches, that is the borders and frontiers of countries. Marquisses were not known in England till king Richard II. in the year 1337, created his great favourite, Robert Vere, the earl of Oxford, marquis of Dublin; since which time there have been many creations of this sort, though at present there is but one english, three scotch and one irish marquisses. The manner of creating a marquis differs in nothing from that of a duke, except the difference of the titles, and the marquis's being conducted by a marquis and an earl, while a duke is led by a duke and a marquis: he is also girt with a sword, has a gold verge put into his hand, and his robe or mantle is the same as those of a duke, with only this difference, that a duke's mantle has four guards of ermine, and a marquis's only three and a half. The title given him, in the style of the heralds, is most noble and potent prince. His cap is the same as a duke's, and the difference between their coronets consists in the duke's being adorned with only flowers or leaves, while the marquis's has flowers and pyramids with pearls on them, intermixed to shew that he is a degree between a duke and an earl.

MARR, that part of Aberdeenshire situated between the rivers Dee and Don. See the article ABERDEEN.

MARRIAGE, a contract both civil and religious, between a man and a woman, by which they engage to live together in mutual love and friendship, for the ends of procreation, *&c.*

The first inhabitants of Greece lived together without marriage. Cecrops, king of Athens, was the first author of this honourable institution among that people. After the commonwealths of Greece were settled, marriage was very much encouraged by their laws, and the abstaining from it was discountenanced, and in many places punished. The Lacedemonians were particularly remarkable for their severity towards those who deferred marrying, as well as to those who wholly abstained from it. The Athenians had an express law, that all commanders, orators, and persons entrusted with any public affairs, should be married men. Polygamy,

gamy, or the having more than one wife at a time, was not commonly tolerated in Greece. See POLYGAMY.

The time of marriage was not the fame in all places; the particular number of years to which they were limited, depended upon the humour of each lawgiver, nothing being generally agreed on in this matter. The feafon of the year the moft proper for marriage, was thought to be the winter, and efpecially the month of January. See GAMELION, &c.

The Greeks thought it fcandalous to contract marriage within certain degrees of confanguinity; whilft moft of the barbarous nations allowed inceftuous mixtures. Moft of the grecian ftates required that citizens fhould match with none but citizens; and the children were not allowed to marry without the confent of their parents: when there were orphan-virgins without any inheritance, the next of kin was obliged to marry them, or to fettle a portion on them according to his quality.

The Romans, as well as the Greeks, difallowed of polygamy. A Roman might not marry any woman who was not a Roman. It was thought difhonourable for a woman to marry twice. Among the Romans the kalends, nones, and ides of each month were thought unlucky to be married in, as was alfo the feaft of the parentalia, or feralia, and the whole month of May was reckoned the moft unhappy feafon.

We find but few laws in the books of Mofes concerning the inftitution of marriage: he reftrained the Ifraelites from marrying within certain degrees of confanguinity; but we find that polygamy, though not exprefly allowed is however tacitly implied in the laws of Mofes: there is a particular law that obliged a man, whofe brother died without iffue, to marry his widow, and raife up children to his brother. The Hebrews purchafed their wives, by paying down a competent dowry for them; and a man was at liberty to marry, not only in any of the twelve tribes, but even out of them, provided it was with fuch nations as ufed circumcifion.

The antient chriftian church laid feveral reftraints upon her members in relation to marriage; fuch was the rule forbidding chriftians to marry with infidels and heathens: another reftraint related to the confanguinity and affinity prohibited in fcripture: a third was, that children under age fhould not marry without the confent of their parents, guardians, or next relations: and another was, that there fhould be fome parity of condition between the contracting parties. They not only condemned polygamy, but even reckoned it unlawful to marry after a divorce. As to the feafon in which marriage might or might not be celebrated in the chriftian church, all we find is, that it was forbidden in lent. The romifh church requires of the clergy perpetual abftinence from marriage; and has advanced this inftitution to the dignity of a facrament. The church of England, though fhe does not confider marriage as a facrament, yet looks upon it as an inftitution fo facred, as that it ought always to be celebrated by an ecclefiaftical perfon; but marriages, without this fanction, are not therefore null and void. There is no cannon of this church, which forbids marriages to be folemnized at any time. The canonical hours for celebrating of matrimony, are from eight to twelve in the forenoon. The impediments to marriage are fpecified in Canon CII. of this church, and are thefe: 1. A preceding marriage, or contract; or any controverfy or fuit depending on the fame. 2. Confanguinity or affinity. 3. Want of confent of parents, or guardians. For the feveral ceremonies regarding marriages, fee BRIDE, BRIDEGROOM, NUPTIAL RITES, HUSBAND, &c.

Marriage, according to our law, cannot be diffolved but by death, breach of faith, or other notorious mifbehaviour. It is requifite to complete a marriage, that there be a free and mutual confent between the parties. The marriages performed by romifh priefts, whofe orders are acknowledged by the church of England, are deemed good in fome inftances; but they ought to be folemnized agreeable to the rites of our own church, to be entitled to the benefits attending on marriage here, fuch as dower, thirds, &c. A marriage in reputation, as among the quakers, is allowed to be fufficient to give title to a perfonal eftate; though in the cafe of a perfon married by a diffenting minifter, who was not in orders, it has been held that where a hufband demands a right due to him as fuch by the ecclefiaftical law, he ought to prove himfelf a hufband, thereby to be entitled to it; and yet this marriage is not altogether a nullity, becaufe by the laws of nature, the contract is binding. On a promife of

marriage, if it be mutual on both fides, damages may be recovered in cafe either party refufes to marry: and though no time for the marriage is agreed on, if the plaintiff avers that he offered to marry the defendant, who refufed it, an action is maintainable for the damages: but no action fhall be brought upon any agreement, except it is in writing, and figned by the party to be charged.

For the better preventing clandeftine marriages, and the inconveniencies arifing therefrom, an act of parliament lately paffed, wherein the following regulations were made, *viz.* That from and after March 25, 1754, banns of matrimony fhall be publifhed in the parifh church or fome public chapel belonging to the parifh wherein the parties dwell, upon three Sundays before the marriage, during the time of fervice, immediately after the fecond leffon: and where the parties dwell in different parifhes, the banns fhall be publifhed in both; and the marriage fhall be folemnized in the church or chapel wherein the banns were publifhed, and no where elfe; and it is alfo required, that both or either of the parties to be married, do refide four weeks at leaft in the parifh where the banns are publifhed. Nothing in this act deprives the archbifhop of Canterbury of his ufual right of granting fpecial licences to marry at any convenient time or place. All marriages folemnized contrary to the forefaid regulations, fhall be void; and the perfon folemnizing the fame, fhall be adjudged guilty of felony, and be tranfported for fourteen years to his majefty's colonies. Marriages folemnized by licence, where either of the parties (not being a widow or widower) fhall be under age, without the confent of the father firft had (if living) or of the guardians or one of them, and where there fhall be no guardians, of the mother (if living and unmarried) or of the guardian appointed by chancery, fhall be void to all intents and purpofes. Where any fuch guardian fhall be non compos mentis, or in parts beyond the fea, or fhall refufe their confent to a proper match, the party may apply by petition to the lord chancellor, lord keeper, or lords commiffioners of the great feal, who fhall proceed on fuch a petition in a fummary way; and where the marriage propofed fhall appear to be proper, they fhall judicially declare the fame to be fo by an order of court, which fhall be deemed effectual. All marriages fhall be folemnized in the prefence of two or more creditable witneffes befides the minifter; and an entry thereof fhall be immediately made in a regifter kept for that purpofe. This act fhall not extend to the marriages of any of the royal family, nor to Scotland, nor to thofe perfons called quakers, nor thofe profeffing the jewifh religion.

Policy of encouraging MARRIAGE. Dr. Hally obferves, that the growth and increafe of mankind is not fo much ftinted by any thing in the nature of the fpecies, as it is from the cautious difficulty moft people make to adventure on the ftate of marriage, from the profpect of the trouble and charge of providing for a family: nor are the poorer fort of people herein to be blamed, who befides themfelves and families, are obliged to work for the proprietors of the lands that feed them; and of fuch does the greater part of mankind confift. Were it not for the backwardnefs to marriage, there might be four times as many births as we find; for by computation from the table, given under the article MORTALITY, there are 15000 perfons above fixteen and under forty-five, of which, at leaft, 7000 are women capable of bearing children; yet there are only 1238, or little more than a fixth part of thefe, that breed yearly: whereas were they all married, it is highly probable that four of fix fhould bring forth a child every year, the political confequences of which are evident. Therefore, as the ftrength and glory of a kingdom or ftate confift in the multitude of fubjects, celibacy above all things ought to be difcouraged, as by extraordinary taxing or military fervice: and, on the contrary, thofe who have numerous families fhould be allowed certain privileges and immunities, like the *jus trium liberorum* among the Romans; and efpecially, by effectually providing for the fubfiftence of the poor.

MARROW, *medulla*, in anatomy, a foft oleaginous fubftance contained in the cavity of the bones.

The marrow of the bones, which anatomifts of many ages took to be a mere fhapelefs and irregular mafs of matter, is found in reality to confift of a number of fine fubtile fat oleaginous fubftances, and of a number of minute veficles of a membranaceous ftructure, in which it is fecreted from the arterial blood in the fame manner as the fat of the reft of the body. It is contained in a greater or

leffer quantity in the cavities of moft of the cylindrical bones: in the cavernous bones there is not properly any marrow, but a kind of red, fatty, medullary juice. The medullary veffels, found running here and there through their appropriated canals, penetrate into the inner cavity of the bones, and fecrete the medullary part from the blood there; the blood being afterwards returned again by the veins. The nerves are diftributed to the fame places for the fake of fenfe and motion. It has been a common opinion, that the marrow increafed and decreafed in quantity according to the increafe and decreafe of the moon; but this is by modern anatomifts thought idle and erroneous; it does, indeed, increafe and decreafe in its feveral cavities, according to the exercife or reft of the animal, or to its eating more or lefs, or better or worfe food. This fubtile oleaginous fubftance penetrates in between the fibres of the bones, and preferves them from drynefs and from that brittlenefs which would be the confequence of it; but it does not nourifh them as was originally believed. See BONE.

MARRUBIUM, HOARHOUND and BASTARD-DITTANY, in botany, a genus of the didynamia-gymnofpermia clafs of plants, with a monopetalous ringent flower, the upper lip of which is erect, femibifid, and acute, and the under lip reflex and femitrifid: the feeds are four, and contained in the cup.

Hoarhound is reputed attenuant and refolvent, and accordingly prefcribed in moift afthmas, and in all difeafes of the breaft and lungs. There ufed to be a compound fyrup of it kept in the fhops, but it is now out of ufe.

MARS, in aftronomy, one of the fuperior planets, moving round the fun in an orbit between thofe of the earth and jupiter. See the article PLANET.

For the diameter of this planet, and its mean diftance from the fun, fee the articles DIAMETER and DISTANCE.

The character of this planet is ♂, the excentricity of its orbit is 141, fuppofing the diftance of the earth from the fun 1000 equal parts; the inclination of its orbit to that of the earth is $1^{\circ}\ 51'$; the periodical time in which it performs its revolution round the fun, is 686 days, 23 hours, $27'$, $30''$; its revolution round its own axis 24 hours, $40'$; and its parallax, $30''$. See the articles CHARACTER, EXCENTRICITY, &c.

In the achronical rifing of this planet, that is, when it is in oppofition to the fun, it is found twice as near the earth as the fun, which is a phænomenon that has greatly difcredited the ptolemaic hypothefis. This planet, as well as the reft, borrows its light from the fun, and has its increafe and decreafe of light like the moon; and it may be feen almoft biffected when in its quadratures with the fun, or in its perigæon; but is never corniculated or falcated, as the inferior planets.

Dr. Hook, in 1665, obferved feveral fpots in this planet, which having a motion, he concluded the planet to have a turbinated motion round its center. In 1666, M. Caffini obferved feveral fpots in the two hemifpheres of mars, which, by continuing his different obfervations very diligently, he found to move by little and little from eaft to weft, and to return in the fpace of 24 hours $40'$ to their former fituation. Whence both the motion and period or natural day of that planet were determined. See the article MACULÆ.

Mars always appears with a ruddy troubled light, whence we conclude that it is encompaffed with a thick cloudy atmofphere, which by difturbing the rays of light in their paffage and re-paffage through it, occafion that appearance: befides the ruddy colour of mars, we have another argument of his being encompaffed with an atmofphere, and it is this, that when any of the fixed ftars are feen near his body, they appear extremely obfcured and almoft extinct; and if this be the cafe, a fpectator in mars would fcarce ever fee mercury, unlefs perhaps in the fun at the time of conjunction, when mercury paffes over his difk, as he fometimes appears to us, in form of a fpot. An eye in mars will fee venus at about the fame diftance from the fun as mercury appears to us, and the earth about the fame diftance from the fun that venus appears to us; and when the earth is found in conjunction with and very near the fun, the eye in mars will fee the earth horned or falcated, and its attendant, the moon, of the fame figure, and at its utmoft diftance from the earth not above fifteen minutes of a degree: and as this planet's diftance from the fun is to the diftance of the earth and fun as $1\frac{1}{2}$ to 1, therefore a fpectator in mars would fee the fun's diameter lefs by one third than it appears to us, and confequently the

degree

degree of light and heat which mars receives from the sun, is less by one third than that received by the earth; this proportion will, however, admit of a sensible variation, on account of the great excentricity of this planet.

Though the period or year of this planet, as has been already observed, is nearly twice as long as ours, and his natural day, or the time in which the sun appears above the horizon (setting aside the consideration of twilight) is almost every where equal to his night; yet it appears that in one and the same place, on his surface, there will be but very little variety of seasons, or scarce any difference of summer and winter: and the reason is, that the axis of his diurnal rotation is nearly at right angles with the plane of his orbit. It will be found, notwithstanding, that places situated in different latitudes, that is, at different distances from his equator, will have very different degrees of heat, on account of the different inclination of the sun's rays to the horizon, as it is with us when the sun is in the equinoxes.

From this consideration Dr. Gregory endeavours to account for the appearance of the fasciæ in mars, which are certain swaths or fillets seen in this planet, and posited parallel to his equator: for as among us, the same climates has at different seasons very unequal degrees of heat, but as in mars it is otherwise, the same parallel having always a pretty equable degree of heat, it follows, that these spots may probably be formed in mars, or in his atmosphere, as snow and clouds are in ours, *viz.* by the constant different intentions of heat and cold in the different parallels, and so come to be extended in circles or belts parallel to his equator, or the circle of his diurnal motion. And this same principle may, perhaps, solve the phænomenon of jupiters belts, that planet, like mars, having a perpetual equinox. See JUPITER.

MARS, among chemists, denotes iron, as being supposed to be under the influence of that planet. See the article IRON.

Crocus of MARS. See the article CROCUS.

Crystals of MARS. See the article CRYSTALS *of Mars.*

Flowers of MARS. See the article FLOS.

Tree of MARS, *arbor martis*, in chemistry, a species of metallic vegetation, the process of making which is this: dissolve steel-filings in spirit of nitre, and to the solution add oil of tartar per deliquium: by this means a fermentation will be excited, which being over, there will be formed beautiful vegetations about the surface, expressing the branches of trees.

MARSALA, a port-town of Sicily, in the province of Mazara: east long. 12° 6', north lat. 37° 50'.

MARSALQUIVER, a port-town of Algiers, on the coast of Barbary, situated on a bay of the sea, opposite to Oran.

MARSEILLES, a city and port of Provence, situated on a fine bay of the Mediterranean, twenty-five miles north-west of Toulon: east long. 5° 20', north lat. 43° 15'.

MARSHAL, in its primary signification, means an officer who has the command or care of horses; but it is now applied to officers who have very different employments, as earl marshal, knight marshal, or marshal of the king's house, &c. See the articles EARL-MARSHAL, KNIGHT-MARSHAL, &c.

MARSHAL *of the king's bench*, an officer who has the custody of the king's bench-prison in Southwark. This officer is obliged to give his attendance, and to take into his custody all persons committed by that court.

MARSHAL *of the exchequer*, an officer to whom that court commits the king's debtors.

MARSHAL *of the king's hall*, an officer who has the care of placing the houshold-servants and strangers at table, according to their quality.

MARSHAL, or MARESCHAL, of France, an officer of the greatest dignity in the french armies. When two or more marshals are in the army, the eldest commands.

MARSHALLING a coat, in heraldry, is the disposal of several coats of arms belonging to distinct families, in one and the same escutcheon or shield, together with their ornaments, parts, and appurtenances.

MARSHFIELD, a market-town of Wiltshire, thirty miles north-west of Salisbury.

MARSHLAND, the west division of Norfolk. See the article NORFOLK.

MARSHMALLOW, *althæa*, in botany and medicine. See the article ALTHÆA.

MARSHY LANDS, those liable to be overflowed by the sea, or large rivers, for the draining of which, see the articles DITCH, DRAIN, &c.

As marshy lands fatten cattle the soonest of any, and preserve sheep from the rot, it would be a great improvement of them to

to raiſe a croſs or ſemicircular bank of earth in them, and to plant this with trees, which might afford ſhelter to the cattle, a thing very much wanted in all of them.

MARSICO, a city of Italy, ſeventy miles ſouth-eaſt of Naples.

MARSILEA, in botany, a genus of the cryptogamia claſs of plants, without any corolla or cup: the antheræ are four, and placed on an obtuſely conic body: the fruit is of a roundiſh figure, conſiſting of four cells, in each of which are contained ſeveral roundiſh ſeeds.

Under this genus are comprehended the ſalvinia of Micheli, and pilularia of Dillenius.

MARSUPIALIS MUSCULUS, in anatomy, a muſcle otherwiſe called the internal obturator. See OBTURATOR.

MARTABAN, a city and port-town of the further India, on the eaſt ſide of the bay of Bengal: eaſt long 97°, north lat. 16° 10′.

MARTES, the martin, in zoology. See the article MARTIN.

St. MARTHA, a city and port-town of Terra Firma, in South America, and the capital of the province of St. Martha: weſt long. 74° 30′, north lat. 11° 45′.

MARTIAL, among phyſicians, an appellation given to the preparations of iron. See the article IRON.

MARTIAL LAW, is the law of war, which entirely depends on the arbitrary power of the prince, or of thoſe to whom he has delegated it. For though the king can make no laws in time of peace without the conſent of parliament, yet in time of war he uſes an abſolute power over the army.

MARTIGUES, a port-town of Provence, in France, ſituated on a bay of the Mediterranean, ſixteen miles weſt of Marſeilles.

MARTIN, *martes*, in zoology, a ſpecies of muſtela, of a blackiſh brown colour, and with a pale throat: it is about the ſize of the common cat, but more ſlender. See the article MUSTELA.

MARTIN is alſo the name of a bird of the hirundo-kind, of a black colour, and with the throat white. See HIRUNDO.

Cape MARTIN, a promontory of Valencia, in Spain, on the Mediterranean: it is under the meridian of London: north lat. 38° 50′.

MARTINGALE, in the manege, a thong of leather, faſtened to one end of the girths under the belly of a horſe, and at the other end to the muſs-roll, to keep him from rearing.

MARTINICO, the chief of the French Caribbee-iſlands, ſituated in 61° of weſt long. and between 14° and 15° north lat. It is ſixty miles long, but is ſcarce twenty broad in any part.

MARTLETS, in heraldry, little birds repreſented without feet, and uſed as a difference or mark of diſtinction for younger brothers, to put them in mind that they are to truſt to the wings of virtue and merit, in order to raiſe themſelves, and not to their feet, they having little land to ſet their foot on. See plate CLXV. fig. 4.

MARTNETS, in a ſhip, ſmall lines faſtened to the leetch of a ſail, reeved through a block on the top-maſt head, and coming down by the maſt to the deck. Their uſe is to bring the leetch of the ſail cloſe to the yard to be furled.

MARTYNIA, in botany, a genus of the didynamia-angioſpermia claſs of plants, with a monopetalous flower, campanulated, gibbous at the baſe, and containing a honey-juice: the fruit is an oblong capſule, containing four ſeeds of the ſame figure.

MARTYR, in the chriſtian ſenſe of the word, is one who lays down his life for the goſpel, or ſuffers death for the ſake of his religion.

The chriſtian church has abounded in martyrs, and hiſtory is filled with ſurprizing accounts of their ſingular conſtancy and fortitude under the crueleſt torments human nature was capable of ſuffering. The primitive chriſtians were accuſed by their enemies of paying a ſort of divine worſhip to the martyrs. Of this we have an inſtance in the anſwer of the church of Smyrna to the ſuggeſtion of the Jews, who, at the martyrdom of Polycarp, deſired the heathen judge not to ſuffer the chriſtians to carry off his body, leſt they ſhould leave their crucified maſter, and worſhip him in his ſtead. To which they anſwered. "We can "neither forſake Chriſt, nor worſhip "any other: for we worſhip him as the "ſon of God; but love the martyrs as "the diſciples and followers of the Lord, "for the great affection they have ſhewn "to their king and maſter." A like anſwer was given at the martyrdom of Fructuoſus in Spain. For when the judge aſked Eulogius, his deacon, whether he would not worſhip Fructuoſus, as think-

ing

ing that though he refused to worship the heathen idols, he might yet be inclined to worship a christian martyr; Eulogius replied, "I do not worship Fructuosus, "but him whom Fructuosus worships." The primitive christians believed, that the martyrs enjoyed very singular privileges: that upon their death they were immediately admitted to the beatific vision, while other souls waited for the completion of their happiness till the day of judgment: and that God would grant chiefly to their prayers the hastening of his kingdom, and shortening the times of persecution.

The churches built over the graves of the martyrs, and called by their names, in order to preserve the memory of their sufferings, were distinguished by the title martyrium, confessio, or memoria.

The festivals of the martyrs are of very antient date in the christian church, and may be carried back at least till the time of Polycarp, who suffered martyrdom about the year of Christ 168. On these days the Christians met at the graves of the martyrs, and offered prayers and thanksgivings to God for the examples they had afforded them: they celebrated the eucharist, and gave alms to the poor; which, together with a panegyrical oration or sermon, and reading the acts of the martyrs, were the spiritual exercises of these anniversaries.

MARTYROLOGY, in the church of Rome, is a catalogue or list of martyrs, including the history of their lives and sufferings for the sake of religion.

The martyrologies draw their materials from the kalendars of particular churches, in which the several festivals dedicated to them are marked; and which seem to be derived from the practice of the antient Romans, who inserted the names of heroes and great men in their fasti, or public registers.

The martyrologies are very numerous, and contain many ridiculous and even contradictory narratives; which is easily accounted for, if we consider how many forged and spurious accounts of the lives of saints and martyrs appeared in the first ages of the church, which the legendary writers afterwards adopted without examining into the truth of them. However some good critics, of late years, have gone a great way towards clearing the lives of the saints and martyrs from the monstrous heap of fiction they laboured under. See the article LEGEND.

MARVEL *of Peru*, in botany, a name used by some for jalap. See JALAP.

MARY MAGDALEN's DAY, a festival of the romish church, observed on the twenty-second of July.

MARYGOLD, or MARSH-MARYGOLD, a plant called by botanists caltha. See the article CALTHA.

Corn MARYGOLD, chrysanthemum. See the article CHRYSANTHEMUM.

French MARYGOLD, in botany, tagetes. See the article TAGETES.

MARYLAND, one of the british plantations in North America, situated between 74° and 78° west long. and between 38° and 40° north lat.

MASANDERAN, a province of Persia, situated on the southern coast of the Caspian sea, and usually comprehended in Gilan.

MASCON, or MACON, a city of France, in the dutchy of Burgundy, thirty-five miles north of Lyons.

MASCULINE, or MASCULINE GENDER, among grammarians, that belonging to the male. See the article GENDER.

MASHAM, a market-town of Yorkshire, situated twenty-four miles north-west of the city of York.

MASIERS, or MESIERS, a town of France, in the province of Champaign, situated on the river Maes, thirty-five miles north-east of Rheims.

MASK, or MASQUE. See the article MASQUE.

MASON, a person employed under the direction of an architect, in the raising of a stone-building.

The chief business of a mason is to make the mortar; raise the walls from the foundation to the top, with the necessary retreats and perpendiculars; to form the vaults, and employ the stones as delivered to him. When the stones are large, the business of hewing or cutting them belongs to the stone-cutters, though these are frequently confounded with masons: the ornaments of sculpture are performed by carvers in stones or sculptors. The tools or implements principally used by them are the square, level, plumb-line, bevel, compass, hammer, chissel, mallet, saw, trowel, &c. See SQUARE, &c.

Besides the common instruments used in the hand, they have likewise machines for raising of great burdens, and the con-

ducting of large ſtones, the principal of which are the lever, pully, wheel, crane, *&c.* See the article LEVER, *&c.*

Free and accepted MASONS, a very antient ſociety or body of men, ſo called, either from ſome extraordinary knowledge of maſonry or building, which they are ſuppoſed to be maſters of, or becauſe the firſt founders of the ſociety were perſons of that profeſſion. Theſe are now very conſiderable, both for number and character, being found in every country in Europe, and conſiſting principally of perſons of merit and conſideration. As to antiquity, they lay claim to a ſtanding of ſome thouſand years. What the end of their inſtitution is, ſeems ſtill in ſome meaſure a ſecret; and they are ſaid to be admitted into the fraternity by being put in poſſeſſion of a great number of ſecrets, called the maſon's word, which have been religiouſly kept from age to age, being never divulged.

MASONRY, in general, a branch of architecture, conſiſting in the art of hewing or ſquaring ſtones, and cutting them level or perpendicular, for the uſes of building: but in a more limited ſenſe, maſonry is the art of aſſembling and joining ſtones together with mortar.

Hence ariſes as many different kinds of maſonry, as there are different forms and manners for laying or joining ſtones. Vitruvius mentions ſeven kinds of maſonry uſed among the antients, three of hewed ſtone, *viz.* that in form of a net, that in binding, and that called the greek maſonry; and three of unhewed ſtones, *viz.* that of an equal courſe, that of an unequal courſe, and that filled up in the middle; and the ſeventh was a compoſition of all the reſt, each in their order.

Net maſonry, called by Vitruvius reticulatum, from its reſemblance to the meſhes of a net, conſiſts of ſtones ſquared in their courſes, and ſo diſpoſed as that their joints go obliquely; and their diagonals are the one perpendicular, and the other level. This is the moſt agreeable maſonry to the eye, but is very apt to crack. See plate CLXX. fig. 6. n° 1.

Bound maſonry, that in which the ſtones were placed one over another like tiles: the joints of their beds being level, and the mounters perpendicular, ſo that the joint that mounts and ſeparates two ſtones, always falls directly over the middle of the ſtone below. This is leſs beautiful than the net work, but it is more ſolid and durable. See *ibid.* n° 2.

Greek maſonry, according to Vitruvius, is that where after we have laid two ſtones, each of which makes a courſe, another is laid at the end, which makes two courſes, and the ſame order is obſerved throughout the building; this may be called double binding, in regard the binding is not only of ſtones of the ſame courſe with one another, but likewiſe of one courſe with another courſe. *Ibid.* n° 3.

Maſonry by equal courſes, called by the antients iſodomum, differs in nothing from the bound maſonry but only in this, that its ſtones are not hewn. *Ibid.* n°. 4.

Maſonry by unequal courſes, called pſeudiſodomum, is alſo made of unhewed ſtones, and laid in bound work: but then they are not of the ſame thickneſs, nor is there any equality obſerved, excepting in the ſeveral courſes; the courſes themſelves being unequal to each other. *Ibid.* n° 5.

Maſonry filled up in the middle, called by the antients emplection, is likewiſe made of unhewed ſtones, and by courſes: but the ſtones are only ſet in order as to the courſes; the middle being filled up with ſtones thrown in at random among the mortar. *Ibid.* n° 6.

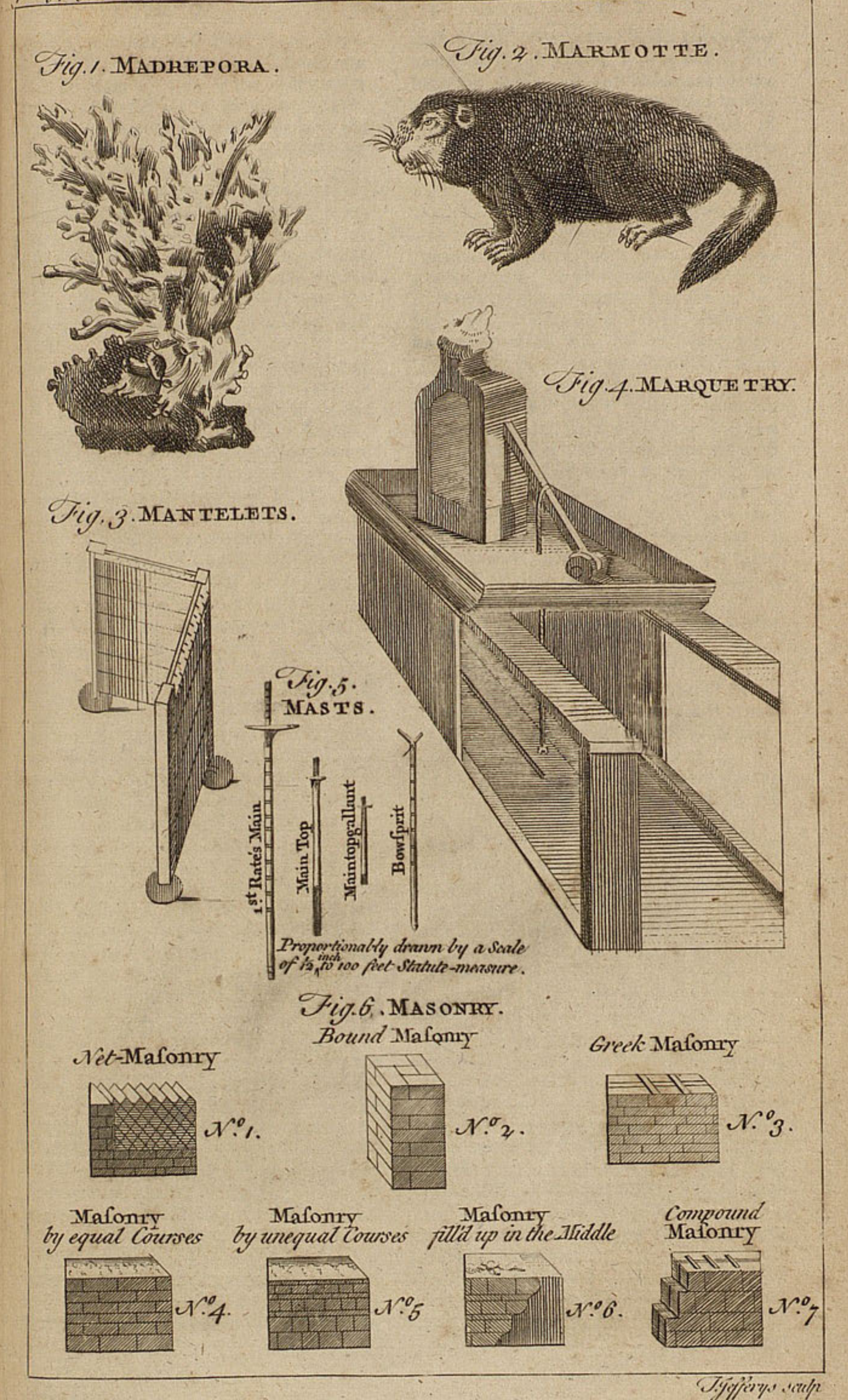
Compound maſonry is of Vitruvius's propoſing, ſo called as being formed of all the reſt. In this the courſes are of hewed ſtone; and the middle being left void, is filled up with mortar and pebbles thrown in together: after this the ſtones of one courſe are bound to thoſe of another courſe with cramp irons faſtened with melted lead. *Ibid.* n° 7.

All the kinds of maſonry now in uſe may be reduced to theſe five, *viz.* bound maſonry; that of brick-work, where the bodies and projectures of the ſtones incloſe ſquare ſpaces or pannels, *&c.* ſet with bricks; that de moilon, or ſmall work, where the courſes are equal, well ſquared, and their edges or beds ruſticated; that where the courſes are unequal; and that filled up in the middle with little ſtones and mortar.

MASQUE, or MASK, a cover for the face, with ſuitable apertures for the eyes and mouth.

MASQUES, in architecture, denotes certain groteſque faces, uſed to fill vacant places, as friezes, pannels of doors, keys of arches, *&c.*

MASQUERADE, an aſſembly of perſons maſked, and dreſſed in peculiar habits, meeting



J. Jefferys sculp.

meeting to dance and divert themſelves.

MASS, *miſſa*, in the church of Rome, the office or prayers uſed at the celebration of the euchariſt ; or in other words, conſecrating the bread and wine into the body and blood of Chriſt, and offering them ſo tranſubſtantiated, as an expiatory ſacrifice for the quick and the dead. As the maſs is in general believed to be a repreſentation of the paſſion of our bleſſed Saviour, ſo every action of the prieſt, and every particular part of the ſervice, is ſuppoſed to allude to the particular circumſtances of his paſſion and death.

The general diviſion of maſſes conſiſts in high and low ; the firſt is that ſung by the choriſters, and celebrated with the aſſiſtance of a deacon and ſub-deacon : low maſſes are thoſe in which the prayers are barely rehearſed without ſinging.

There are a great number of different or occaſional maſſes in the romiſh church, many of which have nothing peculiar but the name : ſuch are the maſſes of the ſaints ; that of St. Mary of the ſnow, celebrated on the fifth of Auguſt ; that of St. Margaret, patroneſs of lying-in women ; that of the feaſt of St. John the baptiſt, at which are ſaid three maſſes ; that of the Innocents, at which the gloria in excelſis, and the hallelujah are omitted, and it being a day of mourning, the altar is of a violet-colour. As to ordinary maſſes ſome are ſaid for the dead, and, it is ſuppoſed, contribute to fetch the ſoul out of purgatory ; at theſe maſſes the altar is put in mourning, and the only decorations are a croſs in the midſt of ſix yellow wax-lights : the dreſs of the celebrant, and the very maſs-book are black : many parts of the office are omitted, and the people are diſmiſſed without the benediction. If the maſs be ſaid for a perſon diſtiguiſhed by his rank or virtues, it is followed with a funeral oration : they erect a chapelle ardente, that is, a repreſentation of the deceaſed, with branches and tapers of yellow wax, either in the middle of the church, or near the deceaſed's tomb, where the prieſt pronounces a ſolemn abſolution of the deceaſed. There are likewiſe private maſſes, ſaid for ſtolen or ſtrayed goods or cattle ; for health ; for travellers, *&c.* which go under the name of votive maſſes. There is ſtill a further diſtinction of maſſes denominated from the countries in which they were uſed ; thus the gothic maſs, or miſſa moſarabum, is that uſed among the Goths when they were maſters of Spain, and which is ſtill kept up at Toledo and Salamanca ; the ambroſian maſs is that compoſed by St. Ambroſe, and uſed only at Milan, of which city he was biſhop ; the gallic maſs, uſed by the antient Gauls ; and the roman maſs, uſed by almoſt all the churches in the romiſh communion.

MASS *of the præſanctified*, *miſſa præſanctificatorum*, is a maſs peculiar to the greek church, in which there is no conſecration of the elements ; but after ſinging ſome hymns, they receive the bread and wine which was before conſecrated. This maſs is performed all Lent, except on Saturdays, Sundays, and the annunciation. The prieſt counts upon his fingers the days of the enſuing week on which it is to be celebrated, and cuts off as many pieces of bread at the altar, as he is to ſay maſſes ; and after having conſecrated them, ſteeps them in wine, and then puts them in a box ; out of which, upon every occaſion, he takes ſome of it with a ſpoon, and putting it on a diſh, ſets it upon the altar.

MASSA, a city of Italy, on the ſouth-ſide of the gulph of Naples, twenty miles ſouth of that capital.

MASSA, the capital of the dutchy of Maſſa Carara, in Italy, ſituated between the territories of Lucca and Genoa : eaſt long. 10° 40′, north lat. 43° 55′.

MASSA is alſo a town of Italy, in the dutchy of Tuſcany : eaſt long. 11° 50′, north lat. 43° 5′.

MASSACHUSET-COLONY, the principal ſub-diviſion of New-England, is bounded by New-Hampſhire, on the north ; by the Atlantic ocean, on the eaſt and ſouth ; and by Connecticut and New-York, on the weſt. It is about 100 miles long, and 40 broad.

MASSALIANS, a ſet of enthuſiaſts who ſprang up about the year 361, in the reign of the emperor Conſtantius, who maintained that men have two ſouls, a celeſtial and a diabolical, and that the latter is driven out by prayer. They pretended to prophecy, and affirmed that they could ſee the trinity with their corporeal eyes ; and believed that the holy ghoſt deſcended viſibly upon them, eſpecially at the time of their ordination, when they trod the devil under foot, and danced upon him.

MASSETER, in anatomy, a muſcle which has its origin in the lower and interior part of the jugum, and its end at the ex-

ternal superficies of the angle of the jaw. The ductus ftenonianus, or falival duct of Steno, paffes over this mufcle.

MASSIVE, among builders, an epithet given to whatever is too heavy and folid: thus a maffive column, is one too fhort and thick for the order whofe capital it bears; and a maffive wall, is one whofe openings or lights are too fmall in proportion.

MASSORA, in matters of literature, a critical work, containing remarks on the verfes, words, letters, and vowel-points of the hebrew-text of the bible; a work more laborious than ufeful, fuch poor obfervations being beneath the notice of men of learning.

MASSOVIA, or WARSOVIA. See the article WARSOVIA.

MAST, in naval architecture, a large timber in a fhip, for fuftaining the yards, fails, &c. See the article SHIP.

In large veffels there are four mafts, *viz.* the main maft, fore-maft, mizen-maft, and bowfprit. The main-maft is the principal one, ftanding in the middle of the fhip: its length, according to fome, fhould be $2\frac{1}{2}$ that of the midfhip-beam. Others give the following rule for finding its length, *viz.* multiply the breadth of the fhip, in feet, by 24: from the product, cut off the laft figure towards the right-hand; and the reft will be the length required. Thus fuppofe the length of the midfhip beam was 30 feet; then $30 \times 24 = 720$, from which cutting off the laft figure, there remains 72 feet for the length of the main-maft. And as for the thicknefs of the main-maft, it is ufual to allow an inch to every yard in length.

In plate CLXX. fig. 5. the reader will fee a firft rate's main-maft, main-top, main-top-gallant, and bowfprit, drawn proportionally by a fcale of $\frac{1}{12}$ of an inch to 100 feet ftatute meafure.

For the proportions, &c of the fore-maft and mizen, fee the articles FORE-MAST and MIZEN.

MASTER, *magifter*, in general, is a title of authority; as the grand mafter of Malta, the mafter of St. Lazarus, &c.

The Romans had a great many officers thus denominated; as the mafter of the people, or dictator; the mafter of the cavalry, foot, cenfus, &c. See the articles DICTATOR, CAVALRY, &c.

MASTER *of arts*, is the firft degree taken up in foreign univerfities, and for the moft part in thofe of Scotland; but the fecond in Oxford and Cambridge; candidates not being admitted to it, till they have ftudied feven years in the univerfity. See the article DEGREE.

MASTER *of the ceremonies*. See the article CEREMONY.

MASTERS *in chancery*, in ordinary, of which there are twelve, the mafter of the rolls being chief, are ufually chofen out of the barrifters of the common law, and fit in chancery, or at the rolls, as affiftants to the lord chancellor and mafter of the rolls.

To them are alfo committed interlocutory reports, ftating of accounts, taking cofts, &c. And fometimes by way of reference, they are impowered to make a final determination of caufes.

They have, time out of mind, had the honour to fit in the lords houfe, without either writ or patent to empower them. They formerly infpected all writs of fummons, which is now performed by the clerk of the petty bag. Meffages from the lords to the commons are carried by them. Affidavits are made before them, and deeds and recognizances acknowledged.

There are alfo mafters in chancery extraordinary, appointed by the lord chancellor in the feveral counties of England, for taking affidavits, recognizances, &c. for the eafe of the fuitors of the court.

MASTER *of the faculties*, an officer under the archbifhop of Canterbury, who grants licences and difpenfations.

MASTER-GUNNER. See GUNNER.

MASTER *of the horfe*, a great officer of the crown, who orders all matters relating to the king's ftables races, breed of horfes; and commands the equerries and all the other officers and tradefmen employed in the king's ftables. His coaches, horfes, and attendants are the king's, and bear the king's arms and livery.

MASTER *of the ordnance*, a great officer, who has the chief command of the king's ordnance and artillery.

MASTER *of the revels*, an officer who orders all things relating to the performance of plays, mafks, balls, &c. at court.

MASTER *of the rolls*, a patent officer for life, who has the cuftody of the rolls of parliament and patents which pafs the great-feal, and of the records of chancery, as alfo commiffions, deeds, recognizances, which, being made of rolls of parchment, gave rife to the name.

In

In abfence of the chancellor he fits as judge in the court of chancery: at other times he hears caufes in the rolls-chapel, and makes orders; but all hearings before him are appealable to the chancellor. He hath a writ of fummons to parliament, and fits on the fecond woollpack next the lord chief juftice.

In his gift are the fix clerks in chancery, the examiners, three clerks of the petty bag, and the fix clerks of the rolls-chapel, where the rolls are kept, and the rolls-houfe for his habitation, &c.

MASTER *of a fhip*, the fame with captain in a merchant-man; but in a king's fhip he is an officer who infpects the provifions and ftores, and acquaints the captain of what is not good, takes particular care of the rigging and of the ballaft, and gives directions for ftowing the hold; he navigates the fhip under the directions of his fuperior officer; fees that the log and log-book be duly kept; obferves the appearances of coafts, and notes down in his journal any new fhoal or rocks under water, with their bearing and depth of water, &c.

MASTER *at arms in a king's fhip*, an officer who daily, by turns, as the captain appoints, is to exercife the petty officers and fhip's company; to place and relieve fentinels; to fee the candles and fire put out according to the captain's orders; to take care the fmall arms are kept in good order, and to obferve the directions of the lieutenant at arms.

MASTER *of the Temple*, fince the diffolution of the order of the templars, the fpiritual guide and paftor of the Temple is fo called, which was the denomination of the founder and his fucceffors.

MASTER *of the wardrobe*, an officer under the lord chamberlain, who has the care of the royal robes, as well as the wearing apparel, collar, george, and garter, &c. He has alfo the charge of all former kings and queens robes remaining in the Tower, all hangings, bedding, &c. for the king's houfe, the charge and delivery of velvet and fcarlet allowed for liveries. He has under him a clerk of the robes, wardrobe keeper, a yeoman, &c.

MASTER-PIECE, *chef d' oeuvre*, is particularly ufed among the French, for a piece of work done by thofe who defire to be admitted mafter of any art or trade, by way of fpecimen of their capacity.

MASTER-WORT, in botany. See the article IMPERATORIA.

Quarter-MASTER. See QUARTER.

MASTICATION, *mafticatio*, in medicine, the action of chewing, or of agitating the folid parts of our food between the teeth, by means of the motion of the jaws, the tongue, and the lips, whereby it is broken into fmall pieces, impregnated with faliva, and fo fitted for deglutition and a more eafy digeftion.

MASTICATORIES, in medicine, fuch remedies as are taken in at the mouth, and chewed in order to promote the evacuation of the falival humour, as tobacco, ginger, pepper, fage, rofemary, thyme, maftich, &c.

MASTICH, in the materia medica, a folid refin, of a pale, yellow, white colour, brought to us principally from the ifland of Chios, in drops or tears as it naturally forms itfelf in exfudating from the tree, about the bignefs and much in the form of a pea. It is to be chofen clear, pellucid, and of a pale yellowifh colour, well fcented, and brittle. We meet with a kind of cæment fometimes kept in the fhops under the name of maftich. It is compofed of maftich and feveral other ingredients, and is formed into cakes for ufe. This is intended for the fervice of the lapidaries, to fill up cracks in ftones, and for other fuch purpofes: but is by no means to be ufed as maftich for any of the medicinal purpofes.

Maftich is detergent, aftringent, and ftomachic; it is greatly recommended in inveterate coughs and againft fpitting of blood. It ftrengthens the ftomach, affifts digeftion, and ftops vomiting. It is ufed externally in plafters to the regions of the ftomach and inteftines; and is faid to ftop vomiting and purgings, by any means.

MASTIGADOUR, MASTICADOUR, or SLABBERING BIT, in the manege, a fnaffle of iron, all fmooth, and of a piece, guarded with paternofters, and compofed of three halfs of great rings, made into demi-ovals, of unequal bignefs; the leffer being inclofed within the greater, which ought to be about half a foot high See the article BIT.

MASTOIDES, in anatomy, the fame with mammillaris; being applied to fuch proceffes in the body as have the appearance of breafts or dugs, arifing in a broad bafis, and terminating in an obtufe top. Maftoides is fometimes applied to the mufcle which ftoops the head, proceeding from the neck-bone and breaft-bone, and terminating in the procefs of the mam-

mammiformis. See the articles MAMMILLARY and MUSCLE.

MASULIPATAN, a city and port-town of the hither India: eaſt long. 81°, and north lat. 16° 18′.

MATAGORDA, a fortreſs at the entrance of the harbour of Cadiz.

MATAMAN, a country in the ſouth-weſt of Africa, bounded by Benguelo, on the north; by Manomotapa, on the eaſt; by Caffraria, on the ſouth; and by the Atlantic ocean, on the weſt.

MATAPAN-CAPE, in the Morea, the ſouth-moſt promontory of Europe, ſituated in eaſt long. 22°, north lat. 36°.

MATARO, a town of Spain, ſituated on the coaſt of Catalonia, twelve miles eaſt of Barcelona.

MATCH, a kind of rope ſlightly twiſted, and prepared to retain fire for the uſes of artillery, mines, fire-works, *&c.*

It is made of hempen tow, ſpun on the wheel like cord, but very ſlack; and is compoſed of three twiſts, which are afterwards again covered with tow, ſo that the twiſts do not appear: laſtly, it is boiled in the lees of old wines. This, when once lighted at the end, burns on gradually and regularly, without ever going out, till the whole be conſumed: the hardeſt and drieſt match is generally the beſt.

MATCHING, in the wine trade, the preparing veſſels to preſerve wines and other liquors, without their growing ſour or vapid. The method of doing it, as directed by Dr. Shaw, is as follows: melt brimſtone in an iron ladle, and when thoroughly melted, dip into it ſlips of courſe linen-cloth; take theſe out, and let them cool: this the wine-coopers call a match; take one of theſe matches, ſet one end of it on fire, and put it into the bung hole of a caſk; ſtop it looſely, and thus ſuffer the match to burn nearly out: then drive in the bung tight, and ſet the caſk aſide for an hour or two. At the end of this time examine the caſk, and you will find that the ſulphur has communicated a violent pungent and ſuffocating ſcent to the caſk, with a conſiderable degree of acidity, which is the gas and acid ſpirit of the ſulphur. The caſk may after this be filled with a ſmall wine, which has ſcarce done its fermentation, and bunging it down tight, it will be kept good, and will ſoon clarify: this is a common and very uſeful method, for many poor wines could ſcarce be kept potable even a few months without it.

MATER *Tenuis*, or *Pia* MATER. See the artices MENINGES and PIA MATER.

MATER DURA, or *dura* MATER. See alſo MENINGES and DURA MATER.

MATERA, a town of Italy, in the kingdom of Naples and territory of Otranto, ſituated thirty miles ſouth-weſt of Barri.

MATERAN, the capital of a kingdom of the ſame name, ſituated on the ſouth coaſt of the iſland of Java. This city is ſaid to lye in eaſt long. 110°, ſouth lat. 7° 45′.

MATERIA SUBTILIS, denotes a fine ſubtile matter which the Carteſians ſuppoſe to pervade and penetrate freely the pores of all bodies, to fill up all their pores ſo as not to leave the leaſt vacuity or interſtice between them; they had recourſe to this machine to ſupport the doctrine of an abſolute plenum, and to make it conſiſtent with the phænomenon of motion, *&c.* See CARTESIAN PHILOSOPHY, PLENUM and VACUUM.

MATERIA CHEMICA, a term uſed by authors to expreſs ſuch bodies as are the peculiar objects of chemical experiments. See LABORATORY and CHEMISTRY.

MATERIA MEDICA, comprehends all the ſubſtances either uſed in medicine in their natural ſtate, or which afford preparations that are ſo; theſe belong partly to the animal, partly to the vegetable, and partly to the foſſil kingdom. See the articles ANIMAL, VEGETABLE and FOSSIL.

The preparations and virtues of all which are delivered under their reſpective articles, but in as conciſe and ſcrupulous a manner as we poſſibly could; ſince we cannot but remark, with the great Boyle, that it is too frequent in writers on the materia medica, to give us rather encomiums than impartial accounts of the ſimples they treat of. However, the ſame great author prefers the uſe of approved ſimples to that of compound medicines, becauſe one or other of the ingredients may have different operations from thoſe intended by the phyſician: and he adds, that he had ſo many unwelcome proofs of this himſelf, that he thought it his duty to caution others againſt the like inconvenience.

MATHEMATICS, from μαθησις, originally ſignified any diſcipline or learning; but, at preſent, denotes that ſcience which teaches, or contemplates, what-

whatever is capable of being numbered or measured, in so far as computable or measurable; and, accordingly, is subdivided into arithmetic, which has numbers for its object, and geometry, which treats of magnitude. See the articles ARITHMETIC and GEOMETRY.

Mathematics are commonly distinguished into pure and speculative, which consider quantity abstractedly; and mixed, which treat of magnitude as subsisting in material bodies, and consequently are interwoven every where with physical considerations.

Mixed mathematics are very comprehensive; since to them may be referred astronomy, optics, geography, hydrography, hydrostatics, mechanics, fortification, navigation, &c. See the articles ASTRONOMY, OPTICS, &c.

Pure mathematics have one peculiar advantage, that they occasion no disputes among wrangling disputants, as in other branches of knowledge; and the reason is, because the definitions of the terms are premised, and every body that reads a proposition has the same idea of every part of it. Hence it is easy to put an end to all mathematical controversies, by shewing, either that our adversary has not stuck to his definitions, or has not laid down true premises, or else that he has drawn false conclusions from true principles; and in case we are able to do neither of these, we must acknowledge the truth of what he has proved.

It is true, that in mixed mathematics, where we reason mathematically upon physical subjects, we cannot give such just definitions as the geometricians: we must therefore rest content with descriptions; and they will be of the same use as definitions, provided we are consistent with ourselves, and always mean the same thing by those terms we have once explained.

Dr. Barrow gives a most elegant description of the excellence and usefulness of mathematical knowledge, in his inaugural oration, upon being appointed professor of mathematics at Cambridge.

The mathematics, he observes, effectually exercise, not vainly delude, nor vexatiously torment studious minds with obscure subtilties; but plainly demonstrate every thing within their reach, draw certain conclusions, instruct by profitable rules, and unfold pleasant questions. These disciplines likewise enure, and corroborate the mind to a constant diligence in study; they wholly deliver us from a credulous simplicity, most strongly fortify us against the vanity of scepticism, effectually restrain us from a rash presumption, most easily incline us to a due assent, perfectly subject us to the government of right reason. While the mind is abstracted and elevated from sensible matter, distinctly views pure forms, conceives the beauty of ideas, and investigates the harmony of proportions; the manners themselves are sensibly corrected and improved, the affections composed and rectified, the fancy calmed and settled, and the understanding raised and excited to more divine contemplations.

MATRASS, CUCURBIT, or BOLTHEAD, amongst chemists. See CUCURBIT.

MATRICARIA, FEVERFEW, in botany, a genus of the syngenesia polygamia superflua class of plants, the compound flower of which is radiated, the hermaphrodite flowers are tubulose and numerous, placed on an hemispherical disc: the female ones are ligulated and placed in the radius: the seeds are oblong, naked and solitary, being contained in the cup, and placed on a convex, naked receptacle. See plate CLXXI. fig. 1.

This plant has always been allowed one of the first places among the hysteric and uterine plants. It has been prescribed in powder from a scruple to half a dram for a dose, but the much better way is in slight infusion made in the manner of tea. Taken in the same manner for a continuance of time, it will bring the menses, though subject to be interrupted and irregular, to their true period, and will remove a number of complaints, the natural consequences of such an irregularity. It is an agreeable carminative and bitter; it strengthens the stomach and disperses flatulencies; and the expressed juice is said to kill worms in the bowels. Hoffman praises it as a febrifuge.

MATRICE, or MATRIX. See the article MATRIX.

MATRICULA, a register kept of the admission of officers and persons entered into any body or society, whereof a list is made.

This word was formerly applied to a kind of alms-house where the poor were provided for, having certain revenues appropriated to it for that purpose.

MATRIX, in anatomy, the ſame with uterus. See the article UTERUS.

MATRIX, in letter-foundery. See the article FOUNDERY.

MATRONALIA, a feſtival of the antient roman matrons, from whom it had its name. It was celebrated on the kalends of March in honour of the god Mars: and was to the roman ladies what the feſtival of the ſaturnalia was to their huſbands; for at this time they ſerved their women ſlaves at tables, and received preſents from their huſbands. See the article SATURNALIA.

There are two reaſons given for its inſtitution: its being kept in remembrance of the peace concluded between the Romans and Sabines by the mediation of the women; or of Ilia, the mother of Romulus, being with child by Mars.

MATROSSES, are ſoldiers in the train of artillery, who are next to the gunners, and aſſiſt them in loading, firing and ſpunging the great guns. They carry fire-locks, and march along with the ſtore-waggons, both as a guard, and to give their aſſiſtance in caſe a waggon ſhould break down.

MATT, in a ſhip, rope-yard, junk, &c. beat flat and interwoven; uſed in order to preſerve the yards from galling or rubbing in hoiſting or lowering them.

MATTADORE, in playing at ombre. See the article OMBRE.

MATTAGESS, in ornithology, a name by which the greater butcher-bird is ſometimes called.

MATTER, *materia*, in phyſiology, whatever is extended and capable of making reſiſtance: hence, becauſe all bodies, whether ſolid or fluid, are extended, and do reſiſt, we conclude that they are material, or made up of matter. The Carteſians, it is true, make matter to conſiſt in extenſion alone; but extenſion, without reſiſtance, is nothing but mere ſpace.

That matter is one and the ſame thing in all bodies, and that all the variety we obſerve ariſes from the various forms and ſhapes it puts on, ſeems very probable, and may be concluded from a general obſervation of the procedure of nature in the generation and deſtruction of bodies. Thus, for inſtance, water, rarified by heat, becomes vapour; great collections of vapours form clouds; theſe condenſed deſcend in the form of hail or rain; part of this collected on the earth conſtitutes rivers; another part mixing with the earth enters into the roots of plants, and ſupplies matter to, and expands itſelf into various ſpecies of vegetables. In each vegetable it appears in one ſhape in the root, another in the ſtalk, another in the flowers, another in the ſeeds, &c. From hence various bodies proceed; from the oak, houſes, ſhips, &c. from hemp and flax we have thread; from thence our various kinds of linen; from thence garments; theſe degenerate into rags, which receive from the mill the various forms of paper; hence our books; which by fire are converted partly into water, partly into oil, another part into air, a fourth part into ſalt, and a fifth into earth; which are called the elements of bodies; and which, mixed with common earth, are again reſuſcitated in various forms of bodies.

According to Sir Iſaac Newton, it ſeems highly probable, that God in the beginning formed matter into ſolid, maſſy, impenetrable, moveable particles, or atoms, of ſuch ſizes and figures, and with ſuch other properties, and in ſuch proportion to ſpace, as moſt conduced to the end for which he formed them; and that theſe primitive particles being ſolids, are incomparably harder than any porous bodies compounded of them, even ſo hard as never to wear or break in pieces; no ordinary power being able to divide what God himſelf made one in the firſt creation. While theſe particles continue entire, they may compoſe bodies of one and the ſame nature and texture in all ages; but ſhould they wear away, or break in pieces, the nature of things depending on them may be changed. Water and earth, compoſed of old worn particles and fragments of particles, would not be of the ſame nature and texture now, with water and earth compoſed of intire particles in the beginning; and therefore, that nature may be laſting, the changes of corporeal things are to be placed only in the various ſeparations and new aſſociations of motions of theſe permanent particles, compound bodies being apt to break, not in the midſt of ſolid particles, but where theſe particles are laid together, and only touch in a few points. See the article ATOM.

The elements, or principles of matter, to

to which all bodies are ultimately reducible, have been already mentioned under the article ELEMENT.

And the exiftence, laws and properties of matter have been treated of under the articles ESSENCE, EXISTENCE, INERTIA, EXTENSION, DIVISIBILITY, GRAVITATION, EXPERIMENTAL PHILOSOPHY, *&c.*

MATTER *in deed*, in law, fignifies a particular matter of fact to be proved by fome deed, and is frequently mentioned with matter of record; as where a man, during his abfence abroad in the king's fervice, is fued to an exigent; in which cafe, if fuch perfon would take advantage of this matter in deed, he muft alledge it before a fcire facias for execution is awarded againft him, otherwife he can have no relief but from matter of record; that is, fome error in the proceedings appearing upon the face of the record.

A difference is likewife made between matter in deed, matter of record, and nude matter; which laft is a naked allegation of a thing done, proved by witneffes only, and neither by record nor deed.

MATTHEW, or *Gofpel of St.* MATTHEW, a canonical book of the New Teftament.

St. Matthew wrote his gofpel in Judea, at the requeft of thofe he had converted, and it is thought he began it in the year 41, eight years after Chrift's refurrection. It was written, according to the teftimony of all the antients, in the hebrew or fyriac language, which was then common in Judea; but the greek verfion of it, which now paffes for the original, is as old as the apoftolical times.

St. Matthew's view in writing his gofpel, was chiefly to fhew the royal defcent of Jefus Chrift, and to reprefent his life and converfation among men. No one of the apoftles enters fo far into the particulars of the actions of Jefus Chrift, or has given fo many rules for the conduct of life. If we compare him with the other three evangelifts, we may obferve a remarkable difference in the order and fucceffion of our Saviour's actions, from chap. iv. to chap. xiv. 13. Some have imputed this variation of St. Matthew to mere chance; and others to choice and defign: however, it can be no prejudice to the truth of the facts, which are the effential part of the gofpel; and as to the order of time, the facred authors were not always folicitous about it.

St. MATTHEW *the Evangelift's day*, a feftival of the chriftian church, obferved on September 21.

St. MATTHEW, in geography, a fmall ifland on the coaft of Guinea, planted by the Portugueze, but deferted: weft long. 9°, fouth lat. 2° 30′.

St. MATTHIAS's *day*, a feftival of the chriftian church, obferved on the 24th of February.

MATTHIOLA, in botany, a genus of plants not reduced to any clafs; its flower is faid to be tubular, with an undivided limb; its ftamina five fubulated filaments, and its fruit a globofe drupe, coronated with the cup, and containing a nut and kernel of the fame fhape with itfelf.

MATTINS, the firft canonical hour, or the firft part of the daily fervice in the romifh church.

MATTURANTS, *maturantia*, in pharmacy, medicines which promote the fuppuration of tumours. See the article SUPPURATIVES.

MATURATION, in furgery, the fame with fuppuration. See the article SUPPURATION.

MAUBEUGE, a town of the Auftrian Netherlands, in the province of Hainault, eleven miles fouth of Mons.

MAULEON, a town of Gafcony in France, feventeen miles fouth-eaft of Bayonne.

MAUNCH, in heraldry, the figure of an ancient coat fleeve, borne in many gentlemen's efcutcheons.

MAUNDY-THURSDAY, is the Thurfday in Paffion-week, which was called Maunday or Mandate-thurfday, from the command which our Saviour gave his apoftles to commemorate him in the Lord's fupper, which he this day inftituted; or from the new commandment which he gave them to love one another, after he had wafhed their feet as a token of his love to them.

Our Saviour's humility in wafhing his difciples feet, is commemorated on this day by moft chriftian kings; who wafh the feet of a certain number of poor people, not indeed with their own royal hands, but by the hands of their lord almoner, or fome other deputy.

St. MAURA, an ifland of the Mediterranean, fituated between the province of Epirus and the ifland of Cephalonia; subject

subject to Venice: east long. 21°, north lat. 38° 50′.

MAURICE, or MORITIUS, an island in the indian ocean, subject to the Dutch: east long. 56°, south lat. 20°.

MAURIENNE ST. JOHN, the capital of the territory of Maurienne, in Savoy, east long. 6° 10′, north lat. 45° 18′.

MAURITANIA, the antient name of the coast of Barbary, from the city of Tangier to that of Algiers; the west part of it, in which Tangier stands, was called Mauritania Tingitana; and that farther east, Mauritania Cæsariensis.

MAUSOLEUM, a magnificent tomb, or funeral monument. The word is derived from Mausolus, king of Caria, to whom Artemisia, his widow, erected a most stately monument, esteemed one of the wonders of the world, and called it, from his name, mausoleum.

St. MAWES, a port and borough town of Cornwall: situated twenty miles north of the Lizard. It sends two members to parliament.

MAXILLA, the jaws, or those parts of an animal in which the teeth are set.

The jaws are shorter in the human frame than in that of any other animal, in proportion to the size of the body; and this is a circumstance that adds greatly to the beauty of the face. The upper jaw is composed of thirteen bones, twelve of which are in pairs: these are, 1. the lachrymal; 2. the nasal; 3. the jugal; 4. the maxillar; 5. the spongiosum inferius; 6. the palatine: the thirteenth is an odd bone, and is called the vomer. These several bones of the upper maxilla are united to one another by a kind of juncture, which appears equal and even, and is called by anatomists junctura per harmoniam.

The maxilla inferior, or lower jaw, is that moveable bone of the head which contains the lower series of teeth; this is composed of two bones which unite in the middle of the chin, by the intervention of a cartilage, which hardens as the child grows, and at length becoming bony, joins the two bones into a continued one, resembling the greek *υ*. It consists of two tables, between which there is a spongy substance, which in children is medullary. The fore part is shallow, and just sufficient to contain the sockets of sixteen teeth. It has two processes, the coronoide and condyloides; four foramina or holes for the passage of blood-vessels and nerves, and six pair of muscles, of which two are depressors, and four elevators; the depressors are called the platysma myoides, and the biventer; and the four pair of elevators are, the crotaphites, the masseters, and the internal and external pterygoidæi, which see under their several names. There is also the maxillary gland, situated on the inside under the lower jaw-bone. See the article GLAND.

MAXIM, an established proposition or principle, in which sense it denotes much the same with axiom. See the article AXIOM.

Maxims are a kind of propositions, which have passed for principles of science, and which, being self-evident, have been by some supposed innate.

MAXIMUM, in mathematics, denotes the greatest quantity attainable in any given case.

If a quantity conceived to be generated by motion, increases, or decreases, till it arrives at a certain magnitude or position, and then, on the contrary, grows lesser or greater, and it be required to determine the said magnitude or position, the question is called a problem de maximis et minimis.

Thus, let a point *m* move uniformly in a right line, from A towards B, and let another point *n* move after it, with a velocity either increasing, or decreasing, but so that it may, at a certain position, D, become equal to that of the former point *m*, moving uniformly.

This being premised, let the motion of *n* be first considered as an increasing one; in which case the distance of *n*



behind *m* will continually increase, till the two points arrive at the cotemporary positions C and D; but afterwards it will again decrease; for the motion of *n*, till then, being slower than at D, it is also slower than that of the preceding point *m* (by the hypothesis;) but becoming quicker afterwards, than that of *m*, the distance *m n* (as has been already said) will again decrease: and therefore is a maximum, or the greatest of all, when the celerites of the two points are equal to each other.

But

But if n arrives at D with a decreasing celerity; then its motion being first swifter, and afterwards slower, than that of m, the distance mu will first decrease and then increase; and therefore is a minimum, or the least of all, in the forementioned circumstance. Since then the distance mn is a maximum, or a minimum, when the velocities of m and n are equal, or when that distance increases as fast through the motion of m, as it decreases by that of n, its fluxion at that instant is evidently equal to nothing. Therefore, as the motion of the points m and n may be conceived such that their distance mn may express the measure of any variable quantity whatever, it follows, that the fluxion of any variable quantity whatever, when a maximum or a minimum, is equal to nothing.

The rule therefore to determine any flowing quantity in an equation proposed, to an extreme value, is, having put the equation into fluxions, let the fluxion of that quantity (whose extreme value is sought) be supposed equal to nothing; by which means all those members of the equation in which it is found, will vanish, and the remaining ones will give the determination of the maximum or minimum required.

Prob. I. To divide a given right line into two such parts, that their product, or rectangle, may be the greatest possible. This is the case, when the line is bissected, or divided into equal parts, as has been shewn under the article FLUXION.

In any mechanical engine the proportion of the power to the weight, when they ballance each other, is found by supposing the engine to move, and reducing their velocities to the respective directions in which they act; for the inverse ratio of those velocities is that of the power to the weight according to the general principle of mechanics. But it is of use to determine likewise the proportion they ought to bear to each other, that when the power prevails, and the engine is in motion, it may produce the greatest effect in a given time. When the power prevails, the weight moves at first with an accelerated motion; and when the velocity of the power is invariable, its action upon the weight decreases, while the velocity of the weight increases. Thus the action of a stream of water or air upon a wheel, is to be estimated from the excess of the velocity of the fluid above the velocity of the part of the engine which it strikes, or from their relative velocity only. The motion of the engine ceases to be accelerated when this relative velocity is so far diminished, that the action of the power becomes equal to the resistance of the engine arising from the gravity of the matter that is elevated by it, and from friction; for when these ballance each other, the engine proceeds with the uniform motion it has acquired.

Prob. II. Let a denote the velocity of the stream, u the velocity of the part of the engine which it strikes when the motion of the machine is uniform, and $a-u$ will represent their relative velocity. Let A represent the weight which would ballance the force of the stream when its velocity is a, and p the weight which would ballance the force of the same stream if its velocity was only $a-u$; Then $p : A :: \overline{a-u}^2 : a^2$, or $p = A \times \frac{\overline{a-u}^2}{aa}$, and p shall represent the action of the stream upon the wheel. If we abstract from friction, and have regard to the quantity of the weight only, let it be equal to qA (or be to A as q to 1) and because the motion of the machine is supposed uniform, $p = q \times A = \frac{A \times \overline{a-u}^2}{aa}$, or $q = \frac{\overline{a-u}^2}{aa}$. The momentum of this weight is $qAu = \frac{Au \times \overline{a-u}^2}{aa}$; which is a maximum when the fluxion of $\frac{u \times \overline{a-u}^2}{aa}$ vanishes, that is, when $u \times \overline{a-u}^2 - 2uu \times a - u = 0$, or $a - 3u = 0$. Therefore, in this case, the machine will have the greatest effect if $u = \frac{a}{3}$, or the weight $qA = \frac{A \times \overline{a-u}^2}{aa} = \frac{4A}{9}$. That is, if the weight that is raised by the engine be less than the weight which would ballance the power in the proportion of 4 to 9; and the momentum of the weight is $\frac{4Aa}{27}$

Prob. III. Suppose that the given weight

P

P (plate CLXXI. fig. 3. n° 1.) descending by its gravity in the vertical line, raises a given weight W by the cord PMW (that passes over the pulley M) along the inclined plane BD, the height of which BA is given; and let the position of the plane BD be required, along which W will be raised in the least time from the horizontal line AD to B.

Let $AB = a$, $BD = x$, $t =$ time in which W describes DB; then the force which accelerates the motion of W is $P - \frac{aW}{x}$, tt is as $\frac{xx}{Px - aW}$, and if we suppose the fluxion of this quantity to vanish, we shall find $x = \frac{2aW}{P}$ or $P = \frac{2aW}{x}$; consequently the plane BD required is that upon which a weight equal to 2 W would be sustained by P; or if BC be the plane upon which W would sustain P, then $BD = 2BC$. But if the position of the plane BD be given, and W being supposed variable, it be required to find the ratio of W to P, when the greatest momentum is produced in W along the given plane BD; in this case, W ought to be to P as BD to $BA + \sqrt{BD + BA} + \sqrt{BA}$.

Questions of this kind may be likewise demonstrated from the common elementary geometry of which the following may serve as an example.

Prob. IV. Let a fluid, moving with the velocity and direction AC (*ibid.* n° 2.) strike the plane CE, and suppose that this plane moves parallel to itself in the direction CB, perpendicular to CA, or that it cannot move in any other direction; then let it be required to find the most advantageous position of the plane CE, that it may receive the greatest impulse from the action of the fluid. Let AP be perpendicular to CE in P, draw AK parallel to CB, and let PK be perpendicular upon it in K; and AK will measure the force with which any particle of the fluid impels the plane EC, in the direction CB. For the force of any such particle being represented by AC, let this force be resolved into AQ parallel to EC, and AP perpendicular to it; and it is manifest, that the latter AP only has any effect upon the plane CE. Let this force AP be resolved into the force AL perpendicular to CB, and the force AK parallel to it; then it is manifest, that the former, AL, has no effect in promoting the motion of the plane in the direction CB; so that the latter, AK, only, measures the effort by which the particle promotes the motion of the plane CE, in the direction CB. Let EM and EN be perpendicular to CA and CB, in M and N; and the number of particles, moving with directions parallel to AC, incident upon the plane CE, will be as EM. Therefore the effort of the fluid upon CE, being as the force of each particle, and the number of particles together, it will be as $AK \times EM$; or, because AK is to AP ($= EM$) as EN to CE, as $\frac{EM^2 EM \times EN}{CE}$; so that CE being given, the problem is reduced to this, to find when $EM^2 \times EN$ is the greatest possible, or a maximum. But because the sum of EM^2 and of EN^2 ($= CM^2$) is given, being always equal to CE^2, it follows that $EN^2 \times EM^4$ is greatest when $EN^2 = \frac{1}{3}CE^2$; for when the sum of two quantities AC and CB (*ibid.* n° 3.) was given, $AC \times CB^2$ is greatest when $AC = \frac{1}{3}AB$, as will be very evident if a semicircle is described upon AD. But when $EN^2 \times EM^4$ is greatest, its square root $EN \times EM^2$ is of necessity at the same time greatest. Therefore the action of the fluid upon the plane CE in the direction CB is greatest when $EN^2 = \frac{1}{3}CE^2$, and consequently $EM^2 = \frac{2}{3}CE^2$; That is, when EM the sine of the angle ACE in which the stream strikes the plane is to the radius, as $\sqrt{2}$ to $\sqrt{3}$; in which case it easily appears from the trigonometrical tables, that this angle is of 54° 44′.

Several useful problems in mechanics may be resolved by what we have just now shewn. If we represent the velocity of the wind by AC, (n° 2.) a section of the sail of a windmill perpendicular to its length by CE, as it follows from the nature of the engine, that its axis ought to be turned directly to the wind, and the sail can only move in a direction perpendicular to the axis, it appears, that when the motion begins, the wind will have the greatest effect to produce this motion, when the angle ACE in which the wind strikes the sail is of 54° 44′. In the same manner, if CB represent the

the direction of the motion of a ſhip, or the poſition of her keel, abſtracting from her lee-way, and A C be the direction of the wind, perpendicular to her way, then the moſt advantageous poſition of the ſail C E, to promote her motion in the direction C B, is when the angle A C E, in which the wind ſtrikes the ſail, is of 54° 44′. The beſt poſition of the rudder, where it may have the greateſt effect in turning round the ſhip, is determined in like manner.

MAY, *maius*, the fifth month of the year, conſiſting of thirty-one days. See the article MONTH and YEAR.

In this month the ſun enters the ſign gemini. See the article GEMINI.

MAY is alſo the name of a little iſland, in the mouth of the frith of Forth, near the coaſt of Fife in Scotland.

MAYENNE, a city of France, in the province of Orleanois: weſt long. 45′, and north lat. 48° 20′.

MAYHEM, or MAIM, in law. See the article MAIM.

MAYL, among falconers, ſignifies to pinion a hawk's wings.

MAYO, one of the Cape Verde iſlands: weſt long. 23°, north lat. 15°.

MAYO is alſo a county of Ireland, in the province of Connaught, having Slego on the north, and Roſcommon on the ſouth.

MAYOR, the chief magiſtrate of a city or town, choſen annually out of the aldermen.

If any perſon intrudes into the office of mayor, a quo warranto lies againſt him, upon which he ſhall not only be ouſted, but fined. And no mayor, or perſon holding an annual office in a corporation for one year, is to be elected into the ſame office for the next; in this caſe, perſons obſtructing the choice of a ſucceſſor, are ſubject to 100 l. penalty. Where the mayor of a corporation is not choſen on the day appointed by charter, the next officer in place ſhall the day after hold a court and elect one; and if there be a default or omiſſion that way, the electors may be compelled to chooſe a mayor, by virtue of a writ of mandamus out of the king's bench. Mayors, or other magiſtrates of a corporation, who ſhall voluntarily abſent themſelves on the day of election, are liable to be impriſoned and diſqualified from holding any office in the corporation.

MAZAGAN, a port-town of Morocco: weſt long. 10°, north lat. 33°.

MAZARA, the capital of the province of the ſame name in Sicily, ſituated on the ſouth-weſt coaſt: eaſt long. 12° 30′, north lat. 37° 42′.

MAZORAH, or MASSORA. See the article MASSORA.

MEACO, a city of the iſland of Niphon, or Japan: eaſt long. 135°, north lat. 35° 20′.

MEAD, an agreeable liquor made of honey and water. See HONEY.

There are many receipts for making mead, of which the following is one of the beſt. Take four gallons of water, and as much honey as will make it bear an egg; add to this, the rind of three lemons; boil it, and ſcum it well as it riſes. Then take it off the fire, and add the three lemons cut in pieces; pour it into a clean tub or open veſſel, and let it work for three days: then ſcum it well, and pour off the clear part into a caſk, and let it ſtand open till it ceaſes to make a hiſſing noiſe; then ſtop it up cloſe, and in three months time it will be fine and fit for bottling.

If you would give it a finer flavour, take cloves, mace, and nutmeg, of each four drams; beat them ſmall, tie the powder in a piece of cloth, and put it into the caſk.

MEADIA, a town of Hungary, in the Bannat of Tameſwaer, fifteen miles eaſt of Belgrade.

MEADOW, in its general ſignification, means paſture, or graſs-land, annually mown for hay; but it is more particularly applied to lands that are ſo low as to be too moiſt for cattle to graze upon them in winter, without ſpoiling the ſward. Too much, or too little water is almoſt equally prejudicial to meadows, but the beſt land for meadows is a rich ſoil, that has a moiſt bottom, eſpecially where a ſmall brook may be brought over it, and where there is ſuch a deſcent that the water will not lodge: theſe are better than thoſe by great rivers, where the crops are often loſt. Thoſe that may be over-flowed at pleaſure, are called water-meadows; theſe ſhould never be over-flowed till the end of March, except once or twice in winter, when there are ſuch floods as bring down a great deal of ſoil from the upper lands, and if the ſeaſon ſhould prove

dry,

dry, it will be of great service to the grafs, if the meadows are overflowed again; but then the cattle fhould not be turned in till the fward is dry enough to bear their weight. Miller recommends the weeding of meadows in April and October, with a fpaddle, and rolling them with a heavy roller in fpring and autumn. See the article PASTURE.

MEAN, in general, denotes the middle between two extremes: thus we fay, mean diftance, mean proportion, &c. See the articles DISTANCE, PROPORTION, &c.

MEAN ANOMALY, in aftronomy. See the article ANOMALY.

MEAN {CONJUNCTION, / OPPOSITION,} in aftronomy, is when the mean place of the fun is in {conjunction, / oppofition,} with the mean place of the moon in the ecliptic. See the articles CONJUNCTION and OPPOSITION.

MEAN *diftance of a planet from the fun*, in aftronomy, is the right line drawn from the fun, to the extremity of the conjugate axis of the ellipfis the planet moves in; and this is equal to the femitranfverfe axis, and is fo called, becaufe it is a mean between the planet's greateft and leaft diftance from the fun. See the article DISTANCE.

MEAN MOTION, in aftronomy, that whereby a planet is fuppofed to move equally in its orbit, and is always proportional to the time. See the article MOTION.

MEASLES, in medicine, a cutaneous difeafe, attended with a fever, in which there is an appearance of eruptions that do not tend to a fuppuration. The meafles begin with chilnefs and fhivering, and heat and cold fucceed by turns. The next day the fever comes on, with great ficknefs, thirft, and lofs of appetite; the tongue is white, but not dry; there is a little cough, a heavinefs of the head and eyes, and a continual fleepinefs; then follows a fneezing, and fwelling of the eye-lids, and a ferous humour oft diftils from the nofe and eyes, which are certain figns that the eruption is at hand. In the face, the fpots are fmall, but on the breaft broad and red. The patient vomits, but oftner has a loofenefs with greenifh ftools. Thefe fymptoms continue and increafe till the fourth, and fometimes the fifth day, at which time the fpots, which are like flea-bites, increafe in number and magnitude, but rife little above the fkin. The fymptoms do not immediately vanifh after the eruption, as in the fmall-pox, except the vomiting. The cough and fever increafe, with difficulty of breathing. About the fixth day, the fkin of the face and forehead begins to grow rough, and the cuticle breaking, the puftules die away; and on the eighth day the fpots difappear in the face, and are fcarce vifible any where elfe; on the ninth, they quite vanifh, and fine, thin, light fcales, fall from the fkin.

The meafles are in general not dangerous, unlefs from an infalubrious epidemical conftitution of the year, which, fometimes renders them malignant; which may be known by a fudden lofs of ftrength, coldnefs of the extreme parts, great reftleffnefs, and a delirium. Thofe who die of the meafles, are generally fuffocated on the ninth day. Some have a loofenefs, which continues feveral weeks, and brings on a mortal tabes. Some have a flow fever, with an atrophy and a fwelling of the abdomen, which are fatal; and when a cough and hoarfenefs remain after the difeafe, a confumption will follow without fpeedy affiftance.

If children are fufpected to abound with crudities in the inteftines, it will be proper to evacuate with half a grain of tartar emetic, and fyrup of fuccory with rhubarb. When there are worms, anthelmintics fhould be given. In adults abounding with blood, phlebotomy is neceffary on the firft days; and as foon as the eruption is ended a gentle cathartic is proper: in a cough, nothing is better than oil of almonds frefh drawn, mixt with fyrup of capillaire; half a fpoonful of which fhould be often given in water-gruel. The patient fhould keep his bed for two days after the firft eruption, and take abforbent and diaphoretic powders, to which half a grain of faffron may be added; thefe fhould be taken every night from the firft onfet of the difeafe, till the patient recover, encreafing or diminifhing the dofe according to his age. If after the meafles difappear, they fhould be followed by a difficulty of breathing, a fever, and other fymptoms of an inflammation of the lungs, let blood be taken freely from the arm, once, twice, or three times, as occafion fhall require,

leaving a due ſpace between each bleeding, and give oil of ſweet almonds, and about twelve days from the invaſion let the patient be purged. The diet ought to be the ſame as in the ſmall-pox, taking particular care that the body be kept lax rather than bound up, through the courſe of the diſtemper. See Pox.

MEASURE, *menſura*, in geometry, denotes any quantity aſſumed as one, or unity, to which the ratio of other homogeneous or ſimilar quantities is expreſſed. This definition is ſomewhat more agreeable to practice than that of Euclid, who defines meaſure, a quantity which being repeated any number of times becomes equal to another. This latter definition anſwers only to the idea of an arithmetical meaſure, or quota-part.

MEASURE *of an angle*, is an arch deſcribed from the vertex in any place between its legs.

Hence angles are diſtinguiſhed by the ratio of the arches, deſcribed from the vertex between the legs to the peripheries. Angles then are diſtinguiſhed by thoſe arches; and the arches are diſtinguiſhed by their ratio to the periphery: thus an angle is ſaid to be ſo many degrees as there are in the ſaid arch. See the article ANGLE.

MEASURE *of a figure*, or plane ſurface, is a ſquare whoſe ſide is one inch, foot, yard, or ſome other determinate length. Among geometricians, it is uſually a rod called a ſquare rod, divided into ten ſquare feet, and the ſquare feet into ten ſquare digits. Hence ſquare meaſures. See the articles TRIANGLE, SQUARE, PARALLELOGRAM, SURVEYING, &c.

MEASURE *of a line*, any right line taken at pleaſure, and conſidered as unity. The modern geometricians uſe a decempeda, or perch, divided into ten equal parts, called feet; the feet they ſubdivide into ten digits, and the digit into ten lines, &c.

MEASURE *of the maſs, or quantity of matter*, in mechanics, is its weight; it being apparent that all the matter which coheres and moves with a body, gravitates with it, and it being found by experiment, that the gravities of homogeneal bodies are in proportion to their bulks; hence, while the maſs continues the ſame, the weight will be the ſame, whatever figure it put on: by which is meant its abſolute weight, for as to its ſpecific, that varies as the quantity of the ſurface varies. See the articles GRAVITY and MOMENT.

MEASURE *of a number*, in arithmetic, ſuch a number as divides another without leaving any fraction: thus 9 is a meaſure of 27.

MEASURE *of a ſolid*, is a cube whoſe ſide is one inch, foot, yard, or any other determinate length. In geometry, it is a cubic perch, divided into cubic feet, digits, &c. hence cubic meaſures, or meaſures of capacity. See the articles SPHERE, CUBE, &c.

MEASURE *of velocity*, in mechanics, the ſpace paſſed over by a moving body in a given time. To meaſure a velocity therefore, the ſpace muſt be divided into as many equal parts as the time is conceived to be divided into; the quantity of ſpace anſwering to ſuch an article of time is the meaſure of the velocity. See the article VELOCITY.

MEASURE, in a legal and commercial ſenſe, denotes a certain quantity or proportion of any thing bought, ſold, valued, or the like. Meaſures are then various, according to the various kinds and dimenſions of the things meaſured. Hence ariſe lineal or longitudinal meaſures, for lines or lengths; ſquare meaſures, for areas or ſuperficies; and ſolid or cubic meaſures, for bodies and their capacities. All which again are very different in different countries, and in different ages, and even many of them for different commodities. Whence ariſe other diviſions of antient and modern meaſures, domeſtic and foreign ones, dry meaſures, liquid meaſures, &c.

Long MEASURES, or MEASURES *of application.* The engliſh ſtandard long meaſure for commerce, or that whereby the quantities of things are ordinarily eſtimated in the way of trade, is the yard, containing three engliſh feet. Its diviſions are the foot, ſpan, palm, inch, and barley-corn; its multiples the pace, fathom, pole, furlong, and mile. The proportions theſe ſeverally bear to each other, are expreſſed in the following table.

English MEASURES of Length.

Barley-corns											
3	Inch										
9	3	Palm									
27	9	3	Span								
36	12	4	1⅓	Foot							
54	18	6	2	1½	Cubit						
108	36	12	4	3	2	Yard					
180	60	20	6⅔	5	3⅓	1⅔	Pace				
216	72	24	8	6	4	2	1⅕	Fathom			
594	198	66	22	16½	11	5½	3 3/10	2¾	Pole		
23760	7920	2640	880	660	440	220	132	110	40	Furlong	
190080	63360	21120	7040	5280	3520	1760	1056	880	320	8	Mile.

Scripture-MEASURES of Length reduced to English.

								Eng. feet.	inch. Dec.
Digit								0	0.912
4	Palm							0	3.648
12	3	Span						0	10.944
24	6	2	Cubit					1	9.888
96	24	8	4	Fathom				7	3.552
144	36	12	6	1½	Ezechiel's reed			10	11.328
192	48	16	8	2	1⅓	Arabian pole		14	7.104
1920	480	160	80	20	13⅓	10	Schœnus, or measuring line.	145	11.04

The Longer Scripture-MEASURES.

						English miles	paces	feet.
Cubit						0	0	1.824
400	Stadium					0	145	4.6
2000	5	Sab. day's journey				0	729	3.000
4000	10	2	Eastern mile			1	403	1.000
12000	30	6	3	Parasang		4	153	3.000
96000	240	48	24	8	a day's journey	33	172	4.000

Grecian MEASURES of Length reduced to English.

												English Paces.	feet.	dec.
Dactylus, digit												0	0	0.7554 11/16
4	Doron, dochme											0	0	3.0218 3/4
10	2 1/2	Lichas										0	0	7.5546 7/8
11	2 3/4	1 1/10	Orthodoron									0	0	8.3101 9/16
12	3	1 1/5	1 1/11	Spithame								0	0	9.0656 1/4
16	4	1 6/10	1 5/11	1 1/3	Foot							0	1	0.0875
18	4 1/2	1 4/5	1 7/11	1 1/2	1 1/8	Cubit						0	1	1.5984 3/8
20	5	2	1 9/11	1 2/3	1 1/4	1 1/9	Pygon					0	1	3.109 3/8
24	6	2 2/5	2 2/11	2	1 1/2	1 1/3	1 1/5	Cubit larger				0	1	6.13125
96	24	9 3/5	8 8/11	8	6	5 1/3	4 4/5	4	Pace			0	6	0.525
9600	2400	960	872 8/11	800	600	533 1/3	480	400	100	Furlong		100	4	4.5
76800	19200	7680	6981 9/11	6400	4800	4266 2/3	3840	3200	800	8	Mile	805	5	0

Roman MEASURES of length reduced to English

										English. Paces.	feet	dec.
Digitus transversus										0	0	0.725 1/4
1 1/3	Uncia									0	0	0.967
4	3	Palmus minor								0	0	2.901
16	12	4	Pes							0	0	11.604
20	15	5	1 1/4	Palmipes						0	1	2.505
24	18	6	1 1/2	1 1/5	Cubitus					0	1	5.406
40	30	10	2 1/2	2	1 2/3	Gradus				0	2	5.02
80	60	20	5	4	3 1/3	2	Passus			0	4	10.02
10000	7500	2500	625	500	416 2/3	250	125	Stadium		120	4	4.5
80000	60000	20000	5000	4000	3333 1/3	2000	1000	8	Milliare	967	0	0

A Table of the MEASURES of Length of the principal Places in Europe, compared with the English Yard.

		Eng. yard.
100	Aunes or ells of England equal to	125
100	of Holland or Amſterdam	75
100	of Brabant or Antwerp	76
100	of France —	$128\frac{1}{4}$
100	of Hamburgh, Francfort, &c.	$62\frac{1}{2}$
100	of Breſlau —	60
100	of Dantzick —	$66\frac{3}{4}$
100	of Bergen and Drontheim	$68\frac{1}{4}$
100	of Sweden or Stockholm	$65\frac{3}{4}$
100	of St. Gall, for linens	$87\frac{1}{2}$
100	of ditto, cloths —	67
100	of Geneva —	$124\frac{3}{4}$
100	Canes of Marſeilles and Montpelier —	$214\frac{1}{2}$
100	of Toulouſe and high Languedoc	200
100	of Genoa, of 9 palms	$245\frac{1}{4}$
100	of Rome —	$227\frac{1}{4}$
100	Varas of Spain — —	$93\frac{3}{4}$
100	of Portugal —	123
100	Cavidos of Portugal —	75
102	Braſſes of Venice —	$73\frac{1}{2}$
100	of Bergamo, &c.	$71\frac{1}{4}$
100	of Florence and Leghorn	64
100	of Milan —	$58\frac{1}{2}$

N. B. The aunes or ells of Amſterdam, Haerlem, Leyden, the Hague, Rotterdam, and other cities of Holland, as alſo that of Nuremberg, being all equal, are comprehended under that of Amſterdam; as thoſe of Oſnabrug are under thoſe of France; and thoſe of Bern and Baſil are equal to thoſe of Hamburg, Francfort, and Leipſic.

For the ſubdiviſions and multiples of each of theſe meaſures of length. See the article AUNE, &c.

For the proportion of the feet of the principal nations of Europe, compared with the engliſh foot, ſee the article FOOT.

Square, or *Superficial* MEASURES. Engliſh ſquare or ſuperficial meaſures, are raiſed from the yard of 36 inches multiplied into itſelf, and thus producing 1296 ſquare inches in the ſquare yard: the diviſions of this are ſquare feet and inches; and the multiples, poles, roods, and acres, as in the following table.

English Square-MEASURES.

Inches	Feet	Yards	Paces	Poles	Rood	acre
144						
1296	9					
3600	25	$2\frac{7}{9}$				
29204	$272\frac{1}{4}$	$30\frac{1}{4}$	10.89			
1568160	10890	1210	435.6	40		
6272640	43560	4840	1743.6	160	4	

Grecian ſquare-meaſures were the plethron, or acre, by ſome ſaid to contain 1444, by others 10000 ſquare feet; and aroura, the half of the plethron. The aroura of the Egyptians was the ſquare 100 cubits.

Roman Square-MEASURE reduced to Engliſh.

The integer was the jugerum or acre, which the Romans divided like the libra or as: thus, the jugerum contained

	ſquare feet.	ſcruples.	Eng. roods.	ſq. poles.	Square feet.
As	28800	288	2	18	250.05
Deunx	26400	264	2	10	183.85
Dextans	24000	240	2	2	117.64
Dodrans	21600	216	1	34	51.42
Bes	19200	192	1	25	257.46
Septunx	16800	168	1	17	191.25
Semis	14400	144	1	9	125.03
Quincunx	12000	120	1	1	58.82
Triens	9600	96	0	32	264.85
Quadrans	7200	72	0	24	198.64
Sextans	4800	48	0	16	132.43
Uncia	2400	24	0	8	66.21

Note, Actus major was 14400 ſquare feet, equal to a ſemis; clima, 3600 ſquare feet, equal to ſeſcuncia; and actus minimus equal to a ſextans.

Cubical MEASURES, or *Meaſures of capacity for liquids*.

The engliſh meaſures were originally raiſed from troy-weight; it being enacted by ſeveral ſtatutes that eight pounds troy of wheat, gathered from the middle of the ear, and well dried, ſhould weigh a gallon of wine meaſure, the diviſions and multiples whereof were to form the other meaſures; at the ſame time it was alſo ordered, that there ſhould be but one liquid meaſure in the kingdom: yet cuſtom has prevailed, and there having been intro-

introduced a new weight, *viz.* the avoirdupois, we have now a ſecond ſtandard-gallon adjuſted thereto, and therefore exceeding the former in the proportion of the avoirdupois weight to troy weight. From this latter ſtandard are raiſed two ſeveral meaſures, the one for ale, the other for beer.

The ſealed gallon at Guildhall, which is the ſtandard for wines, ſpirits, oils, *&c.* is ſuppoſed to contain 231 cubic inches; and on this ſuppoſition the other meaſures raiſed therefrom, will contain as in the table underneath: yet by actual experiment, made in 1688, before the lord-mayor and the commiſſioners of exciſe, this gallon was found to contain only 224 cubic inches: it was however agreed to continue the common ſuppoſed contents of 231 cubic inches; ſo that all computations ſtand on their old footing. Hence as 12 is to 231, ſo is $14\frac{12}{20}$ to $281\frac{1}{2}$ the cubic inches in the ale-gallon: but in effect the ale-quart contains $70\frac{1}{2}$ cubic inches, on which principle the ale and beer-gallon will be 282 cubic inches. The ſeveral diviſions and multiples of theſe meaſures, and their proportions, are exhibited in the following tables.

English MEASURE of Capacity for Liquids.

Wine-Meaſure.

Solid inches	Pint	Gallon	Rundlet	Barrel	Tierce	Hogſhead	Punchion	Butt	Tun.
$28\frac{7}{8}$									
231	8								
4158	144	18							
$7276\frac{1}{2}$	252	$31\frac{1}{2}$	$1\frac{3}{4}$						
9702	336	42	$2\frac{1}{3}$	$1\frac{1}{3}$					
14553	504	63	$3\frac{1}{2}$	2	$1\frac{1}{2}$				
19279	672	84	$4\frac{2}{3}$	$2\frac{2}{3}$	2	$1\frac{1}{3}$			
29106	1008	126	7	4	3	2	$1\frac{1}{2}$		
58212	2016	252	14	8	6	4	3	2	

Ale-Meaſure.

Pints	Gallon	Firkin	Kilderkin	Barrel	Hogſhead.
8					
64	8				
128	16	2			
256	32	4	2		
512	64	8	4	2	

Beer-Meaſure.

Pints	Gallon	Firkin	Kilderkin	Barrel	Hogſhead
8					
72	9				
144	18	2			
288	36	4	2		
576	72	8	4	2	

Jewiſh MEASURES of Capacity for Liquids, reduced to Engliſh Wine-meaſure.

Caph	Log	Cab	Hin	Seah	Bath, or Epha	Coron, or Chomer	Gall.	pints.	Solid inches.
							0	$0\frac{5}{8}$	0.177
$1\frac{1}{3}$							0	$0\frac{5}{6}$	0.211
$5\frac{1}{3}$	4						0	$3\frac{1}{3}$	0.844
16	12	3					1	2	2.533
32	24	6	2				2	4	5.067
96	72	18	6	3			7	4	15.2
960	720	180	60	30	10		75	5	7.625

Attic

Attic MEASURES of Capacity for Liquids, reduced to Engliſh Wine-meaſure.

										Gall.	Pints.	ſol. inch Dec.
Cochliarion										0	$\frac{1}{120}$	0.0356$\frac{5}{12}$
2	Cheme									0	$\frac{1}{60}$	0.0712 $\frac{5}{6}$
2½	1¼	Myſtron								0	$\frac{1}{48}$	0.089$\frac{11}{48}$
5	2½	2	Conche							0	$\frac{1}{24}$	0.178$\frac{11}{24}$
10	5	4	2	Cyathos						0	$\frac{1}{12}$	0.356$\frac{11}{12}$
15	7½	6	3	1½	Oxybaphon					0	$\frac{1}{8}$	0.535 $\frac{3}{8}$
60	30	24	12	6	4	Cotyle				0	$\frac{1}{2}$	2.141 $\frac{1}{2}$
120	60	48	24	12	8	2	Xeſtes			0	1	4.283
720	360	288	144	72	48	12	6	Chous		0	6	25.698
8640	4320	3456	1728	864	576	144	72	12	Metretes	10	2	19.629

Roman MEASURES of Capacity for liquids, reduced to Engliſh Wine-meaſure.

										Gall.	Pints.	ſol. inch Dec.
Ligula										0	0$\frac{1}{48}$	0.117$\frac{5}{12}$
4	Cyathus									0	0$\frac{1}{12}$	0.469 $\frac{2}{3}$
6	1½	Acetabulum								0	0 $\frac{1}{8}$	0.704 $\frac{1}{2}$
12	3	2	Quartarius							0	0 $\frac{1}{4}$	1.409
24	6	4	2	Hemina						0	0 $\frac{1}{2}$	2.818
48	12	8	4	2	Sextarius					0	1	5.636
288	72	48	24	12	6	Congius				0	7	4.942
1152	288	192	96	48	24	4	Urna			3	4 $\frac{1}{2}$	5.33
2304	576	384	192	96	48	8	2	Amphora		7	1	10.66
46080	11520	7680	3840	1920	960	160	40	20	Culeus	143	3	11.095

In the modern liquid meaſures of foreign nations, it is to be obſerved, that their ſeveral veſſels for wine, vinegar, *&c.* have alſo various denominations, according to their different ſizes, and the places wherein they are uſed. The woeders of Germany, for holding rheniſh and moſelle-wines, are different in their gauges; ſome containing 14 aumes of amſterdam-meaſure, and others more or leſs. The aume is reckoned at Amſterdam for 8 ſteckans, or 20 verges, or for $\frac{1}{6}$ of a ton of 2 pipes; or 4 barrels of France or Bourdeaux, which $\frac{1}{6}$ at this latter place is called tiercon, becauſe 3 of them make a pipe or 2 barrels, and 6 the ſaid ton. The ſteckan is 16 mingles, or 32 pints; and the verge is, in reſpect of the ſaid rheniſh and moſelle, and ſome other ſorts of wine, of 6 mingles; but in meaſuring brandy it conſiſts cf 6 $\frac{1}{6}$ mingles. The aume is divided into 4 anckers, and the ancker into 2 ſteckans, or 32 mingles. The ancker is taken ſometimes for $\frac{1}{24}$ of a ton, or 4 barrels, on which footing the bourdeaux-barrel ought to contain at Amſterdam (when the caſk is made according to the juſt gauge) 12 $\frac{1}{2}$ ſteckans, or 200 mingles, wine and lees; or 12 ſteckans, or 192 mingles racked wine; ſo that the bourdeaux-ton of wine contains 50 ſteckans, or 800 mingles, wine and lees; and 48 ſteckans, or 768 mingles of pure wine. The barrels or poinçons of Nantes and other places on the river Loire, contain only 12 ſteckans amſterdam meaſure. The wine-ton of Rochelle, Cognac, Charente, and the Iſle of Rhé, differs very little from the ton of Bourdeaux, and conſequently from the barrels and pipes. A ton of wine of Chaloſſe, Bayonne, and the neighbouring places, is reckoned 60 ſteckans, and the barrel 15, amſterdam meaſure.

The

The muid of Paris contains 150 quarts, or 300 pints, wine and lee; or 280 pints clear wine; of which muids 3 make a ton, and the fractions are

The muid	containing	36 fetiers
The fetier		4 quarts
The quart		2 pints
The pint		2 chopins
The chopin		2 demi-fetiers
The demi fetier		2 poiffons.

The muid is alfo compofed of pipes, or poinçons, quarteaux, queves, and demi-queves: thefe poinçons of Paris and Orleans contain about 15 fteckans amfterdam-meafure, and ought to weigh with the cafk 666 lb. a little more or lefs. In Provence they reckon by milleroles, and the millerole of Toulon contains 66 paris-pints, or 100 pints of Amfterdam, nearly; and the paris pint is nearly equal to the englifh wine-quart.

The butts or pipes from Cadiz, Malaga, Alicant, Benecarlo, Saloe, and Mataro, and from the Canaries, from Lifbon, Oporto, and Fayal, are very different in their gauges, though in affreightments they are all reckoned two to the ton.

Vinegar is meafured in the fame manner as wine; but the meafures for brandies are different: thefe fpirits from France Spain, Portugal, *&c.* are generally fhipped in large cafks called pipes, butts, and pieces, according to the places from whence they are exported, *&c.* In France, brandy is fhipped in cafks called pieces at Bourdeaux, and pipes at Rochelle, Cognac, the Ifle of Rhé, and other neighbouring places, which contain fome more and fome lefs, even from 60 to 90 amfterdam-verges or veertels, according to the capacity of the veffels, and the places they come from, which being reduced into barrels, will ftand as follows, *viz.*

At Rochelle, Cognac, the Ifle of Rhé, and the country of Aunis	27 Veertels	per barrel.
At Nants, and feveral places of Bretagne and Anjou —	29 Veertels	
At Bourdeaux, and different parts of Guienne — —	32 Verges	
At Amfterdam, and other cities of Holland — —	30 Veertels	
At Hamburgh and Lubeck — — —	30 Verges	
At Embden — — — —	27 Verges	

In Provence and Languedoc, brandy is fold by the quintal, the cafks included; and at Bruges, in Flanders, the verges are called fefters of 16 ftops each, and the fpirit is fold at fo much per ftop.

Olive-oil is alfo fhipped in cafks of various fizes, according to the cuftom of the places where it is embarked, and the conveniency of ftowage. In England it is fold by the ton of 236 gallons; and at Amfterdam by the ton of 717 mingles, or 1434 pints. In Provence it is fold by milleroles of 66 paris-pints: from Spain and Portugal it is brought in pipes, or butts, of different gauges; at the firft place it is fold by roves, whereof 40 go to the butt; and at the latter place by almoudas, whereof 26 make a pipe. Train-oil is fold in England by the ton, at Amfterdam by the barrel.

MEASURES *of capacity for things dry.* Englifh dry or corn-meafures are raifed from the winchefter-gallon, which contains $272\frac{1}{4}$ folid inches, and ought to hold of pure running water 9 pounds 13 ounces. This feems to ftand on the foot of the old wine-gallon of 224 cubic inches, 12 being to $14\frac{12}{20}$ as 224 to $272\frac{1}{4}$; but by an act of parliament made in 1697 it is decreed, that a round bufhel, $18\frac{1}{2}$ inches wide, and 8 deep, is a legal winchefter-bufhel. Now fuch a bufhel will only hold 2150.42 cubic inches, confequently the gallon will hold 268.8 cubic inches, the divifions and multiples whereof are as in the following table:

English Dry or Corn-meafure.

Solid inches					
33.6	Pint				
268.8	8	Gallon			
537.6	16	2	Peck		
2150.4	64	8	4	Bufhel	
17203.2	512	64	32	8	Quarter.

Scripture

Scripture-MEASURES of Capacity for things dry, reduced to Englifh Corn-meafure.

							Peck	Gal.	Pint.	folid inch. Dec.
Gachal							0	0	$0\frac{17}{120}$	0.031
20	Cab						0	0	$2\frac{5}{6}$	0.073
36	$1\frac{4}{5}$	Gomor					0	0	$5\frac{1}{10}$	1.211
120	6	$3\frac{1}{3}$	Seah				1	0	1	4.036
360	18	10	3	Epha			3	0	3	12.107
1800	90	50	15	5	Leteeh		16	0	0	26.500
3600	180	100	30	10	2	Chomer, or Coron	32	0	1	18.969

Attic MEASURES of Capacity for things dry, reduced to Englifh Corn-meafure.

							Peck	Gal.	Pint.	Solid inch. Dec.
Cochliarion							0	0	0	$0.276\frac{7}{20}$
10	Cyathos						0	0	0	$2.763\frac{1}{2}$
15	$1\frac{1}{2}$	Oxybaphon					0	0	0	$4.144\frac{1}{4}$
60	6	4	Cotyle				0	0	0	16.579
120	12	8	2	Xeftes			0	0	0	33.158
180	18	12	3	$1\frac{1}{2}$	Choenix		0	0	1	$15.705\frac{3}{4}$
8640	864	576	144	72	48	Medimnos	4	0	6	3.501

Roman MEASURES of Capacity for things dry, reduced to Englifh Corn-meafure.

						Peck	Gal.	Pint.	Solid inch. Dec.
Ligula						0	0	$0\frac{1}{48}$	0.01
4	Cyathus					0	0	$0\frac{1}{12}$	0.04
6	$1\frac{1}{2}$	Acetabulum				0	0	$0\frac{1}{8}$	0.06
24	6	4	Hemina			0	0	$0\frac{1}{2}$	0.24
48	12	8	2	Sextarius		0	0	1	0.48
384	96	64	16	8	Semimodius	0	1	0	3.84
768	192	128	32	16	2 Modius	1	0	0	7.68

In the feveral parts of Europe, falt, which is a more ftaple and current commodity than any other, is bought and fold by different meafures, according to the feveral places of its difpatch: at Amfterdam it is fold by the cent of 404 meafures, or fcheppels, which cent is reckoned to be 7 lafts, or 14 tons, and the laft is to weigh 4000 lb. the 7 lafts making 28000 lb. called the cent of falt, which alfo contains 208 facks; though fome of this commodity is much heavier than others. In the cities of France, falt is fold by the muid, whofe fize varies according to the different places of its manufacture and difpatch. At Paris this meafure is reckoned to contain 12 fetiers, or 48 minots, which minot is alfo divided into other meafures. The cent of falt from Marans, Brouage, Sude, and the Ifle of Rhé, contain 28 fricken muids, and each muid 24 boifeaux, which yields at Amfterdam $11\frac{1}{2}$ lafts, or 23 tons, more or lefs. In Copenhagen the faid cent renders only $9\frac{2}{3}$ lafts, the laft being reckoned here equal to 18 tons, and 50 lafts to correfpond with 52 of Coningfberg, at which place the cent produces about 10 lafts, or 40000 lb. At Riga the faid cent yields the fame meafure as at Coningfberg, and about $6\frac{1}{4}$ lafts of Riga make the great cent of Amfterdam. The faid french cent produces at Dantzick from $11\frac{1}{2}$ to 12 lafts, of which lafts from $7\frac{1}{4}$ to $7\frac{1}{2}$ make likewife the great cent

cent of Amfterdam. At Stetin in Pomerania, the french cent yielded ten lafts, making 40,000 meafure and weight of the faid place. In Portugal it is bought by the muid, of which four make a laft, and feven the cent of Amfterdam. At Alamat and Ivica it is fold by the modin, which weighs from $27\frac{1}{2}$ to 28 hundred weight englifh.

MEASURE *of wood*, for firing. See the article CORD *of wood*.

MEASURE *for horfes*, is the hand, which by ftatute contains four inches.

MEASURE is alfo ufed to fignify the cadence and time obferved in poetry, dancing, and mufic, to render them regular and agreeable. See METRE.

MEASURE, in mufic, the interval or fpace of time which the perfon who beats time takes between the rifing and falling of his hand, in order to conduct the movement fometimes quicker and fometimes flower, according to the mufic or fubject that is to be fung or played. See TIME.

MEAT, *cibus*, in medicine. See the articles FOOD, DIET, DRINK, &c.

MEATH, the name of two counties in Ireland, in the province of Leinfter, diftinguifhed by the epithets eaft and weft.

MEATUS AUDITORIUS, in anatomy, the auditory paffage. See EAR.

The entrance of this paffage is guarded by hairs, as well to keep out foreign bodies, as to break the impetus of the external air; and for much the fame purpofes does the cerumen, or ear-wax, ferve. See the article CERUMEN.

Anatomifts likewife gave the name of meatus cyfticus, to the biliary duct; and meatus urinarius, to the urinary paffage in women. See BILE, URINE, &c.

MEAUX, a city of France, twenty-four miles north eaft of Paris.

MEB, or WINDER-MEB, a bird of the larus or gull kind, about the fize of a widgeon. See the article LARUS.

MECCA, the capital of Arabia, and place of Mahomet's nativity: eaft long. 43° 30′, north lat. 21° 20′.

It is a large well-built city, in the middle of which ftands the caaba, or temple. See the article CAABA.

MECHANICS, that branch of practical mathematics which confiders motion and moving powers, their nature and laws, with their effects in machines. See the article MACHINE.

The term mechanics is equally applied to the doctrine of the equilibrium of powers, more properly called ftatics; and to that fcience which treats of the generation and communication of motion, which conftitutes mechanics ftrictly fo called. See STATICS, POWER, MOTION, &c.

The knowledge of mechanics is one of thofe things, fays Mr. Mac Laurin, that ferves to diftinguifh civilized nations from barbarians. It is by this fcience, that the utmoft improvement is made of every power and force in nature; and the motions of the elements, water, air, and fire, are made fubfervient to the various purpofes of life: for however weak the force of man appears to be, when unaffifted by this art; yet, with its aid, there is hardly any thing above his reach. It is diftinguifhed, by Sir Ifaac Newton, into practical and rational mechanics; the former of which treats of the mechanical powers, *viz.* the lever, balance, axis and wheel, pulley, wedge, fcrew, and inclined plane. See the articles LEVER, BALLANCE, &c.

Rational mechanics comprehends the whole theory of motion; fhews, when the powers or forces are given, how to determine the motions that are produced by them; and, converfely, when the phænomena of the motions are given, how to trace the powers or forces from which they arife. See MOTION.

Thus it appears, that the whole of natural philofophy, befides defcribing the phænomena of nature, is little more than the proper application of rational mechanics to thofe phænomena: in tracing the powers that operate in nature from the phænomena, we proceed by analyfis; and in deducing the phænomena from the powers or caufes that produce them, we proceed by fynthefis. But in either cafe, in order to proceed with certainty, and make the greateft advances, it is neceffary that the principles of mechanics fhould be clearly eftablifhed; which has already been done under the articles INERTIA, GRAVITY, EXPERIMENTAL PHILOSOPHY, and COMMUNICATION *of motion*.

For though the caufes of the motions, the nature of the impreft force, or of the refiftance, be unknown or obfcurely underftood; yet this obfcurity does not hinder us from tracing its effects in mechanics with fufficient evidence, provided we can fubject its action to a juft menfuration: and, in fact, we know that excellent contrivances have been invented for raifing weights, and overcoming their refiftances, by thofe who gave themfelves no

no trouble to enquire into the caufe of gravity.

The mechanical powers, according to their different ftructure, ferve for different purpofes; and it is the bufinefs of the fkilful mechanic to choofe them, or combine them, in the manner that may be beft adapted to produce the effect required, by the power he is poffeffed of, and at the leaft expence. The lever can be employed to raife weights a little way only, unlefs the engine itfelf be moved; as, for example, to raife ftones out of their beds, in quarries. But the axis and wheel ferve for raifing weights from the greateft depths. The pullies being eafily portable aboard fhips, are therefore much employed in them. The wedge is excellent for feparating the parts of bodies; and the fcrew, for compreffing or fqueezing them together; and its great friction is fometimes of ufe, to preferve the effect already produced by it.

The ftrength of every engine, and of all its parts, muft be proportioned to the effects which they are to produce. And as we found, when treating of the lever, that the fulcrum placed between the power and weight muft fuftain the fum of their efforts, therefore a fmall balance ought not to be employed for weighing great weights; neither, on the other hand, are great engines proper for producing fmall effects. See the articles ENGINE, MILL, &c.

But befides the raifing of weights, and overcoming refiftances, we have often other objects in view; as to make clocks and watches, to meafure time as exactly as poffible; and to conftruct machines, that by their movements, may illuftrate the motions of the heavenly bodies, as orreries, planetariums, cometariums, &c. See the articles CLOCK, ORRERY, PLANETARIUM, &c.

MECHANICAL, an epithet applied to whatever relates to mechanics: thus we fay, mechanical powers, caufes, &c. See the articles POWER, CAUSE, &c.

The mechanical philofophy is the fame with what is otherwife called corpufcular philofophy. See CORPUSCULAR.

This manner of reafoning is much ufed in medicine, and according to Dr. Quincy, is the refult of a thorough acquaintance with the ftructure of animal bodies: for confidering an animal body as a compofition out of the fame matter, from which all other bodies are formed, and to have all thofe properties which concern a phyfician's regard, only by virtue of its peculiar conftruction; it naturally leads a perfon to confider the feveral parts, according to their figures, contexture, and ufe, either as wheels, pullies, wedges, levers, fcrews, cords, canals, ftrainers, &c. For which purpofe, continues he, it is frequently found helpful to defign in diagrams, whatfoever of that kind is under confideration, as is cuftomary in geometrical demonftrations.

For the application of this doctrine to the human body, fee the article HUMAN.

MECHANICAL, in mathematics, denotes a conftruction of fome problem, by the affiftance of inftruments, as the duplicature of the cube and quadrature of the circle, in contradiftinction to that which is done in an accurate and geometrical manner.

MECHANICAL CURVE, is a curve, according to Defcartes, which cannot be defined by any algebraic equation: and fo ftands contradiftinguifhed from algebraic or geometrical curves.

Leibnitz and others call thefe mechanical curves tranfcendental, and diffent from Defcartes in excluding them out of geometry. Leibnitz found a new kind of tranfcendental equations, whereby thefe curves are defined: but they do not continue conftantly the fame in all points of the curve, as algebraic ones do. See the article TRANSCENDENTAL.

MECHLIN, a large well built and fortified city of Brabant, twelve miles north-eaft of Bruffels.

MECHOACAN, a province of Mexico, bounded by Panuco, on the north; by Mexico Proper, on the eaft; by the Pacific ocean, on the fouth; and by Guadalajara, or New Galicia, on the weft.

MECHOACAN, in the materia medica, a large root of a plant of the convolvulus or bindweed-kind. It is of a fomewhat rough furface, marked with feveral imperfect annular furrows; but it is always fent over in flices, to which it has been cut for the convenience of drying it. The root in powder is a gentle and mild purgative: it does not occafion ficknefs or gripings during its operation: and it is recommended by many in preference to jalap in all chronic cafes occafioned by obftructions of the vifcera; but it is now little ufed. Its dofe is from one to two drams.

MECKLENBURG DUTCHY, a province of Germany, in the province of Lower Saxony, about 100 miles long, and 60 broad;

broad; bounded by the Baltic sea, on the north; by Pomerania, on the east; by Brandenburg, on the south; and by the dutchies of Holstein, Lunenburg and Lawenburg, on the west.

MECON, a great river, which rises in the north of further India, and running south through the kingdoms of Laos and Cambodia, falls into the Indian ocean.

MECONIUM, in medicine, a black thick fæces gathered in the intestines of infants and brought with them into the world at the time of their birth. The retention of these fæces is one of the diseases to which infants are liable; for the cure of which, see the article INFANT.

MECONIUM, in pharmacy, the extract of english poppies.

Meconium has all the virtues of the foreign opium, but in a somewhat lower degree. See the article OPIUM.

MEDAL, a piece of metal in the form of coin, intending to convey to posterity the portrait of some great person, or the memory of some illustrious action.

The parts of a medal are the two sides, one of which is called the face, or head, and the other the reverse. On each side is the area, or field, which makes the middle of the medal; the rim, or border; and the exergum: and on the two sides are distinguished the type, or the figure represented, and the legend, or inscription.

As to the antiquity of medals, the greek are certainly the most antient; for long before the building of Rome, the Greeks had beautiful money in gold, silver, and copper. This plainly appears from several genuine medals of Macedon, older than Philip and Alexander; from greek medals with the names of several magistrates prior to the macedonian empire; to which we may add some sicilian coins of still greater antiquity. As the greek medals are the most antient, so are they the most beautiful; they have a design, accuracy, force and delicacy that expresses even the muscles and veins, and are struck with such exquisite art, as the Romans could never come up to. Those struck when Rome was governed by consuls, are the most antient among the Romans: but the copper and silver medals do not go beyond the 484th year of Rome, nor the gold, beyond the year 546. Among the imperial medals, we distinguish between the upper and lower empire: the first commenced under Julius Cæsar, and ended A. D. about 260; the lower empire includes near 1200 years, and ends at the taking of Constantinople. It is the custom, however, to account all the imperial medals till the time of the Paleologi, among the antique tho' we have none of any considerable beauty later than the time of Heraclius, who died in 641. The gothic medals make part of the imperial ones. Modern medals are those struck within these 300 years. There are no true hebrew medals, except a few shekels of copper and silver, but none of gold; tho' there is mention made of one in the king of Denmark's cabinet.

There was formerly no difference between money and medals. An old Roman had his purse full of the same pieces that we now preserve in cabinets. As soon as an emperor had done any thing remarkable, as gaining a victory, giving up a tax, or the like, it was immediately stamped on a coin, and became current through his whole dominions. This was a pretty device to spread abroad the virtues of an emperor, and make his actions circulate; and thus a fresh coin was a kind of gazette, that published the latest news of the empire.

Several of our modern coins have the legend round the edges: but the antients were too wise to register their exploits on so nice a surface. As to the figures upon medals, the Romans always appear in the proper dress of their country, so that we may observe the little variations of the mode in the drapery of the medal: they would have thought it ridiculous to have drawn an emperor of Rome in a grecian cloak, or a phrygian mitre. On the contrary, we often see a king of England or France, dressed up like a Julius Cæsar, as if they had a mind to pass themselves upon posterity for roman emperors. Nothing is more usual than to see allusions to roman customs and ceremonies on the medals of our own nation; nay, they very often carry the figure of an heathen god. If posterity take its notions of us from our medals, they must fancy that one of our kings paid a great devotion to Minerva, another to Apollo, &c. or, at least, that our whole religion was a mixture of paganism and christianity. Had the old Romans been guilty of the same extravagance, there would have been so great a confusion in their antiquities, that their coins would not have had half the use we now find in them.

The use of medals is very considerable: they give a very great light into history, in confirming such passages as are true in old authors, in reconciling such as are told in different manners, and in recording such as have been omitted. In this case a cabinet of medals is a body of history. It was, indeed, the best way in the world to perpetuate the memory of great actions, thus to coin out the life of an emperor, and to put every exploit into the mint. It was a kind of printing before the art was invented; and they have this advantage over books, that they tell their story quicker, and sum up a whole volume in twenty or thirty reverses: thus Mr. Vaillant, out of a small collection of medals, has given us a chronicle of the kings of Syria. They are, indeed, the best epitomes in the world, and let us see, with one cast of the eye, the substance of above an hundred pages. Another use of medals is, that they not only shew the actions of an emperor, but at the same time mark out the year in which they were performed; for as every exploit has its date set to it, a series of an emperor's coins is his whole life digested into annals. A medallist, upon the first naming of an emperor, will immediately tell his age, family, and life. To remember where he enters in the succession, he only considers in what part of the cabinet he lies; and by running over in his thoughts such a particular drawer, will give an account of all the remarkable parts of his reign. Nor are medals of less use in architecture, painting, poetry, &c. A cabinet of medals is a collection of pictures in miniature, and by them the plans of many of the most considerable buildings of antiquity are preserved.

Impressions of MEDALS. A very easy and elegant way of taking the impressions of medals and coins, not generally known, is thus directed by Dr. Shaw: melt a little isinglass-glue made with brandy, and pour it thinly over the medal, so as to cover its whole surface; let it remain on for a day or two, till it is thoroughly dry and hardened, and then taking it off, it will be fine, clear, and hard, as a piece of muscovy-glass, and will have a very elegant impression of the coin.

Another easy method is as follows: Take a perfect and sharp impression in the finest black sealing-wax, of the coin or medal you desire. Cut away the wax round the edges of the impression; then with a preparation of gum water, of the colour you would have the picture, spread the paint upon the wax-impression with a small hair-pencil, observing to work it into all the sinking or hollow places, these being the rising parts of the medal; and the colour must be carefully taken from the other parts with a wet finger. Then take a piece of very thin post-paper, a little larger than the medal, and moisten it quite through. Place it on the wax-impression, and on the back of the paper lay three or four pieces of thick woollen cloth or flannel, of about the same size. The impression, with its coverings, should be placed between two smooth iron plates, about two inches square, and one tenth of an inch thick. These must be carefully put into a small press, made of two plates of iron, about five inches and a half long, one inch and a half wide, and half an inch in thickness, having a couple of long male screws running thro' them, with a turning female screw on each, to force the plates together. These being brought evenly together, by means of the screws, will take off a true and fair picture of the medal; which, if any deficiencies should appear, may easily be repaired with a hair pencil, or pen, dipped in the colour made use of.

If a relievo only be desired, nothing is necessary, but to take a piece of card, or white paste-board, well soaked in water, then placing it on the wax-mould, without any colouring, and letting it remain in the press for a few minutes, a good figure will be obtained.

This method of taking off medals, &c. is convenient, and seems much more so than the several inventions usually practised in sulphur, plaster of Paris, paper, &c. wherein a mould must be formed, either of clay, horn, plaster, or other materials, which requires a good deal of time and trouble.

MEDALLION, or MEDALION, a medal of an extraordinary size, supposed to be antiently struck by the emperors for their friends, and for foreign princes and embassadors; but that the smallness of their number might not endanger the loss of the devices they bore, the Romans generally took care to stamp the subject of them upon their ordinary coins.

Medallions, in respect of the other coins, were the same as modern medals in respect of modern money: they were exempted from all commerce, and had no other value but what was set upon them by the fancy of the owner. Medallions

are so scarce that there cannot be any set made of them, even though the metals and sizes should be joined promiscuously.

MEDELIN, a town of Spain, twenty miles east of Merida.

MEDELPADIA, a small province of Sweden lying northward of Helsingia.

MEDENBLICK, a port-town of Holland, situated on the Zuyder sea, ten miles north of Hoorn.

MEDEOLA, in botany, a genus of the hexandria-trigynia class of plants, the flower of which consists of six oblong, patent, and revolute petals: the fruit is a berry of a roundish form, with three cells, in each of which is contained a single cordated seed.

MEDIA, in geography, the antient name of Gilan. See the article GILAN.

MEDIAL, or ALLIGATION MEDIAL, in arithmetic. See ALLIGATION.

MEDIAL VOICE, *vox media*, in greek grammar. See the article VOICE.

MEDIANA, a vein formed by the concourse of the cephalic and basilic veins in the bend of the elbow.

MEDIASTINA, in anatomy, a name given to both a vein and an artery of the mediastinum. See the next article.

MEDIASTINUM, in anatomy, is a double membrane continuous to the sternum, situated under it, and adhering firmly to it. It divides the cavity of the thorax longitudinally into two parts: but as it is not exactly under the middle of the sternum, but somewhat to the left side, the right part of the thorax is larger than the left.

The mediastinum is connected with the sternum, pleura, pericardium, and other adjoining parts. It receives veins and arteries from the mammary and diaphragmatic vessels, and sometimes has proper and particular ones of its own from the aorta and cava: these are then called the mediastinal vessels. Its nerves, which are small, are from the diaphragmatics and the par vagum. It has also a number of lymphatics, which run to the ductus thoracicus.

The uses of the mediastinum are two. The first is to divide the breast longitudinally into two parts, by which several great purposes are answered; as, 1. That on one of the lobes of the lungs being ulcerated, the other might not be immediately affected. 2. That water, matter, or any thing else contained in one part of the thorax, might not at the same time affect both parts of the lungs. 3. That in case of a wound in one side of the thorax, respiration might be continued in the other, and the person not be immediately suffocated. The second general use of the mediastinum, is to support the heart in its pendulous state, for the benefit of its free motion, especially when we lie on our backs.

MEDIASTINUM CEREBRI, the same with the transverse septum of the brain. See the article BRAIN.

MEDIATE, or INTERMEDIATE, something that stands between and connects two or more terms, considered as extremes; in which sense it is opposed to immediate.

MEDICAGO, in botany, a genus of the diadelphia decandria class of plants, with a papilionaceous flower, and a long compressed and crooked pod for its fruit.

This genus comprehends the medicago, medica falcata, and cochleata of authors.

MEDICINE, *medicina*, the art which treats of the means of preserving health, when present; and of restoring it, when lost.

If we look back to the origin of the art of medicine, we shall find its first foundations to be owing to mere chance, unforeseen events, and natural instinct: in the early ages, the sick were placed in cross-ways, and other public places, to receive the advice of those passengers who knew an efficacious remedy suitable to their disorder. And the better to preserve the memory of a remarkable cure, both the disease and the remedy were engraved on pillars, or written on the walls of temples, that patients in the like cases might have recourse to them for instruction and relief. Thus what mere accident had discovered, was registered in these chronicles of health. This art arose from repeated trials and long experience, which gave an insight into the virtues of herbs and plants, metals and minerals.

As to the part which reason has acted in the improvement of medicine, it seems to have consisted in observing, 1. That diseases attended with particular circumstances, called symptoms, were sometimes cured without the assistance of art, by spontaneous evacuations, as hæmorrhages, diarrhœas, vomitings, or sweats; whence bleeding, purges, and vomits took their rise. 2. That the patients were often relieved, by the breaking out of various tumours; whence arose the application of topical remedies. And, indeed, it is the best method of improv-

ing physic, to observe carefully what means nature, unassisted by art, employs to free the constitution from distempers; since many important hints may be thence taken, for the relief of other patients under the like circumstances.

So much for the rise of this art. Let us now say something of the regular method of studying it. And first, with Boerhaave, let us imagine the young student laying the foundation of his art in the contemplation of geometrical figures, bodies, weights, measures, velocity, the fabric of machines, and the power of acting upon other bodies thence arising. While he employs his thoughts about these matters, he is likewise taught a just method of reasoning; after which he may proceed to inform himself of the properties of fluidity, elasticity, tenuity, weight, and tenacity of liquids, from hydrostatics. His reason being by this time much improved, he next applies to study the forces of fluids upon machines, and of these upon fluids; and to demonstrate them by mathematics, confirm them by hydrostatics, and illustrate them by chemical experiments; at the same time entertaining himself with speculations on the nature of fire, water, air, salts, and other homogeneous bodies. Having laid this foundation, his next business is to apply himself to the study of anatomy, in order to obtain a clear idea of the human fabric. To this he joins the knowledge of the vital fluids, and examines them with the assistance of anatomy, chemistry, hydrostatics, and even of the microscope; and so now you see him qualified for writing a theory of health, and investigating the causes of diseases. Now behold him busied in furnishing himself with medicinal observations, from all quarters; sometimes he dissects the dead bodies of persons, whose diseases he had observed; at other times, he marks the symptoms of sickness procured by art in brutes; and at length collecting together all the effects of diseases, with their remedies, whether learned from his own experience, or found in the best authors, he digests, considers, and compares them with those which are demonstrated by theory. This, he tells us, is the method which he took himself, and which he recommended to his pupils, in order to gain a thorough knowledge of medicine.

If, then, he would advance the healing art, he ought to collect a select treasure of practical observations, rest satisfied with a few but well chosen medicines, be thoroughly acquainted with their virtues and efficacy in different constitutions and diseases, despise the cumbersome load of recipes with which practical writers of an inferior rank abound, reject the so much extolled medicines of the chemists, and attempt the relief of patients by a proper diet and exercise, and such medicines as observation and sound philosophy recommend: for to the improvement of anatomy and natural philosophy is much of the success of physic to be attributed.

The knowledge of medicines, or suitable remedies, is also highly necessary to physicians; who, in order to moderate the impetus in acute disorders, make evacuations, blunt acrimony, dilute too thick fluids, condense those that are too thin, brace up too lax parts, and relax such as are too much constricted; they also derive the humours to parts where they will be least prejudicial, upon occasion mitigate pain, and in languors, use stimulating medicines. Wine, vinegar, barley, nitre, honey, rhubarb, opium, and other simples, are found both safe and powerful medicines. Sydenham tells us, that all manner of diseases may be cured by bleeding, purging, with a subsequent opiate, and proper regimen. In chronical cases, mineral waters, salts, diaphoretics, soap, mercury, steel, with a few vegetables, and proper exercise, will generally effect the cure.

As to the drugs recommended by the antients, adds Boerhaave, we are, and always shall be ignorant of them, unless perhaps a few; since they contented themselves with giving the virtues; omitting the description of plants, as things well known. The moderns, on the other hand, have been accurate in the descriptive part, but have given us very little concerning the virtues of plants, except what they transcribed from the antients, and this upon an uncertain supposition of the plants being the same. To conclude, what is there in the most elaborate preparation, that is worth half the pains taken about it? Mercury, opium, the peruvian bark, and other simples, with fire and water, are acknowledged as the surest remedies by the ablest masters of the art; and these are found to be more efficacious in that crude state, in which bountiful nature has imparted them to us, than after the most operose and artificial preparations.

We

We can despair of nothing, while we follow simplicity; but the event of intricate labour is fallacious.

As to the general divisions of medicine, they are these. 1. Physiology, or the doctrine of the animal oeconomy, the use of the several parts, whether solids, vessels, or fluids: under this branch is comprehended anatomy. 2. Hygieine, which lays down rules for the preservation of health, and the prolongation of life: its objects are chiefly the six non-naturals. 3. Pathology, or the doctrine of diseases, their differences, causes, symptoms, and other accidents. 4. Semeiotice, is that part of medicine which treats of the signs of diseases, and their use; as also how the various degrees and effects of health and sicknefs may be known. 5. Therapeutace, is the last and principal part, comprehending diet, pharmacy, surgery, and the method of cure; considering the materia medica, the preparation of remedies, and the manner of using them, in order to recover health and banish diseases. See the article PHYSIOLOGY, *&c.*

MEDICINES, *medicamenta*, whatever substances serve to restore health. See the article MATERIA MEDICA, *supra.*

Medicines are either simple or compound; the former being formed by nature alone, and the latter owing to the industry of men, by variously mixing the simple ones together.

Medicines are likewise distinguished, from the manner of using them, into internal or external; and with regard to their effects, they are said to be astringent, cathartic, emetic, *&c.* See ASTRINGENTS, CATHARTICS, *&c.*

Mechanical operation of MEDICINES. To account for the operations of medicines mechanically, seems to have been the favourite scheme of physicians and physiologists of the last and present century. Stahl and his disciples reject these accounts, and think them sufficiently refuted by the operation of opium, and of astringents. One grain of opium, properly taken, will, for a time, assuage pains all over the body. A very few grains of crocus martis astringens sometimes stop an haemoptysis, before they can be supposed to have entered into the humours of the body. Is it not past all belief, say they, that so few grains, mixed with so many pounds of fluids, should retain any mechanical force, especially as it is well known, that astringents lose their force by dilution. They farther urge, that the various effects of the same medicine are a refutation of the mechanical hypothesis; thus emetics sometimes purge, and *vice versa*; astringents encreafe haemorrhages; opium excites alacrity in some instead of stupifying. Again, the sight, or even bare imagination of some medicines, will produce a sensible effect on the body, without any contact. Stahl and his followers therefore hold, that medicines operate chiefly by exciting the vital sense; and that this is the chief effect of medicines, even where they seem most to act mechanically.

Hoffman, Heister, and others, have attacked the hypothesis of Stahl. We shall not pretend to give any farther account of the controversy. Perhaps in this, as in others, there may be a good deal of logomachy. Strictly speaking, mechanical principles must be insufficient to account for the operation of medicines, as this sometimes undoubtedly depends (in the primae viae at least) on chemical principles; and no body has hitherto been able to account mechanically for the phaenomena of chemistry. The laws of the minima naturae have not hitherto been reduced to those of the pressure and impulse of large sensible masses. And perhaps when the laws, that obtain in the minute parts of matter, have been found, we shall still be at a loss to account for all the phaenomena of animated bodies, particularly the human.

Pocket-MEDICINES, in surgery, those which a surgeon ought to carry always about him, in a box or convenient case. Those, according to Heister, are the common digestive ointment, and the brown or egyptian ointment, for cleansing and digesting foul ulcers, and some vulnerary balsams, as the linimentum Arcaei, or the balsam of Peru, of Gilead or Capivi, or the Samaritan balsam: to these must also be added a plaster or two, as the diachylon, or stypticum Crollii, since one or other of these is almost constantly wanted. Neither should there be wanting a piece of blue vitriol for the taking down luxuriant flesh, and to stop haemorrhages; but if vitriol is wanting, burnt alum, red precipitate, the infernal stone, or any other corrosive medicine, will supply its place in corrosive intentions, and the last will also serve to open abscesses, to make issues, and perform many other operations of that kind.

With these there should always be kept in

in readineſs alſo a quantity of ſcraped lint, that the ſurgeon may be able to give immediate aſſiſtance to wounded perſons, ſince, if he is unprepared for this, they may eaſily be taken off by an hæmorrhage; a circumſtance which ought alſo to prevail with him to be always provided with ſuitable bandages. See the article BANDAGE.

MEDIETAS LINGUÆ, in law, ſignifies a jury, or inqueſt impanelled, of which the one half are natives of this land, and the other foreigners. This jury is never uſed except where one of the parties in a plea is a ſtranger, and the other a denizen. In petit-treaſon, murder, and felony, foreigners are allowed this privilege, but not in high-treaſon, becauſe an alien in that caſe ſhall be tried according to the rules of the common law, and not by a medietas linguæ. A grand jury ought not in any caſe to be of a medietas linguæ, and the perſon that would have the advantage of a trial in this way, is to pray the ſame, otherwiſe it will not be permitted on a challenge of the jurors.

MEDIMNUS, μέδιμνος, in grecian antiquity, a meaſure of capacity. See the article MEASURE.

MEDINA, a city of Arabia Deſerta, ſituated two hundred miles north-weſt of Mecca: in eaſt long. 40° 35′, north lat. 24° 30′.

This is called the city of the prophet, on account of Mahomet's being received and protected by the inhabitants on his flight hither from Mecca, where the mahometan æra commences.

MEDINA CELI, a city of Spain, in the province of Old Caſtile, and territory of Siquenca, ſituated in weſt long. 2° 45′, north lat. 40° 20′.

MEDINA SIDONIA, a city of Spain, in the province of Andaluſia, twenty miles eaſt of Cadiz.

MEDINA DEL RIO SECCO, a city of Spain, in the province of Leon, fifty two miles ſouth-eaſt of the city of Leon.

MEDINA DEL CAMPO, another city of Spain, in the province of Leon, fifty miles north-eaſt of Salamanca.

MEDITERRANEAN-SEA, extends from the Straits of Gibraltar, to the coaſts of Syria and Paleſtine, being upwards of 2000 miles in length, but of a very unequal breadth; the weſt-part of it ſeparates Europe from Africa; and the Levant or eaſt-part of it, divides Aſia from Africa. See EUROPE, *&c.*

MEDITULLIUM, is uſed by anatomiſts for that ſpungy ſubſtance between the two plates of the cranium, and in the interſtices of all laminated bones. See the article DIPLOE.

MEDIUM, in logic, the mean or middle term of a ſyllogiſm, being an argument, reaſon, or conſideration for which we affirm or deny any thing: or, it is the cauſe why the greater extreme is affirmed or denied of the leſs in the concluſion. See the articles SYLLOGISM, EXTREMES, and CONCLUSION.

MEDIUM, in arithmetic, or *arithmetical* MEDIUM, or MEAN, called in the ſchools, medium rei, that which is equally diſtant from each extreme, or which exceeds the leſſer extreme as much as it is exceeded by the greater, in reſpect of quantity not of proportion: thus 9 is a medium between 6 and 12. See the article PROPORTION.

Geometrical MEDIUM, called in the ſchools medium perſonæ, is that where the ſame ratio is preſerved between the firſt and ſecond, as between the ſecond and third terms, or that which exceeds in the ſame ratio, or quota of itſelf, as it is exceeded: thus 6 is a geometrical medium between 4 and 9.

MEDIUM, in philoſophy, that ſpace or region through which a body in motion paſſes to any point; thus æther is ſuppoſed to be the medium through which the heavenly bodies move; air, the medium wherein bodies move near our earth; water, the medium wherein fiſhes live and move; and glaſs is alſo a medium of light, as it affords it a free paſſage. That denſity or conſiſtence in the parts of the medium, whereby the motion of bodies in it is retarded, is called the reſiſtance of the medium, which together with the force of gravity, is the cauſe of the ceſſation of the motion of projectiles.

Subtile or *ætherial* MEDIUM. Sir Iſaac Newton makes it probable, that beſides the particular aerial medium, wherein we live and breathe, there is another more univerſal one, which he calls an ætherial medium, vaſtly more rare, ſubtile, elaſtic, and active than air, and by that means, freely permeating the pores and interſtices of all other mediums, and diffuſing itſelf through the whole creation; and by the intervention hereof, he thinks it is that moſt of the great phænomena of nature are effected. This medium he ſeems to have recourſe to, as the firſt and moſt remote phyſical ſpring, and the ultimate

ultimate of all natural causes. By the vibrations of this medium, he takes heat to be propagated from lucid bodies, and the intensenefs of heat increased and preserved in hot bodies, and from them communicated to cold ones. By this medium, he takes light to be reflected, inflected, refracted, and put alternately in fits of easy reflection and transmission, which effects he elsewhere ascribes to attraction; so that this medium appears the source and cause even of attraction. Again, this medium being much rarer within the heavenly bodies than in the heavenly spaces, and growing denser as it recedes further from them, he supposes the cause of the gravitation of these bodies towards each other, and of the parts towards the bodies. Again from the vibrations of this same medium excited in the bottom of the eye, by the rays of light, and thence propagated through the capillaments of the optic nerves into the sensory, he takes vision to be performed; and so hearing from the vibrations of this or some other medium excited in the auditory nerves by the tremors of the air, and propagated through the capillaments of the nerves into the muscles; and thus contracting and dilating them.

The elastic force of this medium, he shews, must be prodigious. Light moves at the rate of 70,000,000 miles in about seven minutes, yet the vibrations and pulses of this medium, to cause the fits of easy reflection and easy transmission, must be swifter than light, which is 700,000 times swifter than sound. The elastic force of this medium therefore in proportion to its density must be above 490,000,000,000 times greater than the elastic force of the air in proportion to its density; the velocities and pulses of the elastic mediums, being in a subduplicate ratio of the elasticities and the rarities of the mediums taken together; and thus may the vibrations of this medium be conceived as the cause of the elasticity of bodies.

MEDLAR, MESPILUS, in botany, &c. See the article MESPILUS.

MEDNICK, a city of Poland in the province of Samogitia: east long. 22° 15′, north lat. 56°.

MEDULLA, MARROW, in anatomy. See the article MARROW.

MEDULLA OBLONGATA, is the lower and medullary part of the cerebrum and cerebellum, formed into a kind of tail, and extended to the great foramen or hole in the occipital bone of the cranium, where it gives origin to the spinal marrow, and to the nerves of the brain. See the articles BRAIN and NERVES.

MEDULLA SPINALIS, or spinal marrow, is a continuation of the medulla oblongata of the brain, and forms, as it were, a tail to that part. It is included in a kind of bony canal, formed by the vertebræ, and in this is continued from the head to the extremity of the os sacrum. Its length is therefore the same with that of the spina dorsi, which is different in persons of different stature. Its thickness, in general, is nearly equal to that of a finger; but it is not uniformly of the same diameter throughout. Its substance in the upper part, as far as to the last vertebra of the thorax, is the same with that of the medulla oblongata of the brain; but somewhat tougher and more firm: they are externally of a medullary substance, that the nerves may easily make their way out; internally cineritious, and of the same nature with the cineritious or cortical part of the brain: but the lower part of them, from the last vertebra of the thorax to the extremity of the os sacrum, is fibrous and very tenacious, and is called cauda equina. The division of the spinal marrow is formed by means of a fissure: it is by this separated into a right and left part, or into two columns; but this separation is not continued to the center. Its proper integuments are no less than six: these are, 1. The bony canal, formed by the cavities of the twenty four vertebræ, and the os sacrum: 2. The tunica, which is very strong, and connects the vertebræ within: 3. The cellular, or adipose coat, which, in fat persons, always contains more or less fat, and seems destined by nature to soften the former: 4. The dura mater, which is stronger in the upper part, and finer and weaker in the lower; this loosely incloses the medulla in the spine, and, in its anterior part, is firmly connected with the vertebræ: 5. The tunica arachnoides, which in its anterior part, adheres very firmly to the pia mater, but in its posterior part is loose and fluctuating: 6. The pia mater, which surrounds every part of the spinal marrow, and all the nerves that arise from it, and enters also its longitudinal division. The arteries and veins

veins of the ſpinal marrow enter at the apertures of the vertebræ, which give paſſage out to the nerves: they make a multitude of anaſtomoſes, and are derived from the vertebrals of the neck, the intercoſtals, and the lumbar. The nerves of the ſpine are thirty-one, or as others count them, thirty-two pair. Theſe are compoſed each of a multitude of fibres, ariſing from the anterior and poſterior parts of the medulla: theſe fibres afterwards unite, and are connected by and covered with membranes, and in that ſtate they conſtitute what we call nerves.

The uſes of the ſpinal marrow are, to give origin to the before-mentioned pairs of nerves, which are principally diſtributed to the limbs and external parts; and to ſecrete and prepare a nervous fluid.

MEDUSA, in zoology, a genus of naked inſects, the body of which is of an orbiculated figure and convex, and is of a gelatinous ſubſtance, and not hairy: the tentacula, or the plicæ, which are in the place of them, are ſituated in the center of the under part of the animal.

Authors have deſcribed ſeveral of the ſpecies of this genus, under the names pulmo marinus and urtica marina. See the articles PULMO and URTICA.

MEDUSA'S HEAD, in aſtronomy. See the article ALGOL.

MEDUSA'S HEAD, in natural hiſtory, a name given by ſome to the ſtar-fiſh. See the articles STAR-FISH.

MEDWAY, a river which riſes in Aſhdown Foreſt in Suſſex, and running through Kent, is divided into two branches by the Iſle of Sheppey, one of which is called Eaſt Swale, and the other Weſt Swale.

MEETER, or METRE. See METRE.

MEGEN, a town of Dutch Brabant, ten miles ſouth-weſt of Nimeguen.

MEGIERS, a town of Tranſilvania, ſubject to the houſe of Auſtria: eaſt long. 24° 25′, north lat. 47° 5′.

MEHAIGN, a river of the Auſtrian Netherlands, which riſes in the province of Namur, and falls into the Maes, a little weſt of Huy.

MEI, or MISERERE MEI, in medicine. See the article MISERERE.

MEISSEN, once the capital of the marquiſate of Miſſen or Miſnia, in Upper Saxony, on the river Elbe, ten miles north of Dreſden.

MEL, HONEY. See the article HONEY.

MELAMPODIUM, in botany, a genus of the ſyngeneſia polygamia neceſſaria claſs of plants, the compound flower of which is radiated, and the particular hermaphrodite ones infundibuliform, and ſituated on the diſc; the ſtamina are five very ſmall filaments: the receptacle of the ſeeds is paliaceous.

MELAMPYRUM, a genus of the didynamia angioſpermia claſs of plants, with a ringent monopetalous flower, and a roundiſh bilocular capſule for its fruit, containing a number of ſeeds.

MELANCHOLY, in medicine, a kind of delirium, attended with gloomy thoughts, heavineſs and ſorrow, without any apparent cauſe; ariſing from an exceſſive congeſtion of blood in the brain. This dreadful diſeaſe is nearly allied to madneſs, and only differs from it in degree. See the article MADNESS.

MELANE, among phyſicians. See the article ALPHOS.

MELANTERIA, in natural hiſtory, a very beautiful foſſil of a denſe, compact, and regular texture, and of an extremely bright pale-yellow, reſembling nothing ſo much as the pureſt gold: it is remarkably heavy, and is uſually found in little irregular maſſes of the bigneſs of a pigeon's egg, which are broken with a ſlight blow: but it is uſually met with in the form of a fine gold-coloured effloreſcence or vitriolic and pyritical bodies; or in looſe, ſhattery, and friable maſſes of a more duſky yellow, in which latter ſtate it ſo much reſembles a native ſulphur, that it is frequently miſtaken for one: however, it is not inflammable; but calcines in the fire to a greyiſh powder, which by burning longer changes to a deep and fine purple.

The Greeks uſed it externally, as a gentle eſcharotic and a ſtyptic: they made it an ingredient in their ointments for old ulcers, and uſed to ſprinkle the powder of it on freſh wounds to ſtop the hæmorrhage.

MELANTHIUM, in botany, a genus of the hexandria trigynia claſs of plants; the female flower of which has no cup, and is compoſed of five lanceolated petals: the fruit is an ovato-triangular capſule with three cells in each of which are contained ſeveral oblong, compreſſed, and membranaceous ſeeds.

MELANURUS, in ichthyology, a ſpecies of Sparus, variegated with a number of lon-

longitudinal lines, and with a black spot on each side at the tail. See the article SPARUS.

MELASTOMA, in botany, a genus of the decandria digynia class of plants, the flower of which consists of five roundish petals; and its fruit is a roundish berry, with five cells, each containing a number of seeds.

MELAZZO, a town of Turky, in the Lesser Asia, situated on a bay of the Archipelago: east long 28°, north lat. 37° 20′.

MELCHITES, in church-history, the name given to the Syriac, Egyptian, and other Christians of the Levant. The Melchites, excepting some few points of little or no importance, which relate only to ceremonies and ecclesiastical discipline, are in every respect professed Greeks; but they are governed by a particular patriarch, who resides at Damas, and assumes the title of patriarch of Antioch. They celebrate mass in the Arabian language. The religious, among the Melchites, follow the rule of St. Basil, the common rule of all the greek monks. They have four fine convents, distant about a day's journey from Damas, and never go out of the cloister.

MELCHIZEDECHIANS, in church-history, a sect which arose about the beginning of the third century, and affirmed, that Melchisedech was not a man, but a heavenly power, superior to Jesus Christ: for Melchisedech, they said, was the intercessor and mediator of the angels, but Jesus Christ was so only for men, and his priesthood only a copy of that of Melchisedech. This heresy was revived in Egypt by one Hierax, who pretended that Melchisedech was the Holy Ghost. See HIERACITES.

MELCK, a town of Germany, in Lower Austria, situated on the Danube, forty-seven miles west of Vienna.

MELCOMB REGIS, a borough town of Dorsetshire, six miles south of Dorchester. It sends two members to parliament.

MELDERT, a town of the Austrian Netherlands, in the province of Brabant, eight miles south of Lovain.

MELDORP, a town of the circle of Lower Saxony, and dutchy of Holstein: east long. 8° 50′, north lat. 54° 40′.

MELEAGRIS, the TURKEY, in ornithology. See the article TURKEY.

MELES, the BADGER, in zoology, is ranked by Linnæus under the same genus with the civet-cat and ichneumon; in all which the fore-teeth are obtuse, and those of the upper jaw striated. They have likewise all a bag of secreted matter, situated near the anus. See the articles ICHNEUMON and ZIBETHICUS.

The badger is about the size of a small dog, with a short and thick body. Its fur is composed of bristly hairs, which being yellow towards the roots, of a blackish brown in the middle, and of a deeper yellow at the tips, give the creature an odd mixture of deep brown and pale yellow, which together form a kind of grey; whence the animal itself is called the grey, in many places. See plate CLXXI. fig. 2.

MELIA, the BEAD-TREE, in botany, belongs to the decandria-monogynia class of plants, the flower of which is composed of five long, patent, and lanceolated petals; the fruit is a soft, globose drupe, with a roundish nut, marked with furrows, and containing five cells, in each of which is an oblong kernel.

MELIA TERRA, in natural history, the same with melinum. See MELINUM.

MELIANTHUS, HONEY-FLOWER, in botany, a genus of the didynamia-polypetala class of plants, the flower of which consists of four petals; and its fruit is a capsule with four cells, each containing a roundish seed.

MELIAPOUR, a city on the coast of Cormandel in India, and the same with St. Thomas. See *St.* THOMAS.

MELICA, in botany, a genus of the triandria digynia class of plants, the flower of which is composed of two valves, not aristated, and containing a single seed.

It is frequent in woods, and is called by authors gramen avenaceum, or oat-grass.

MELICERES, in surgery, a kind of encysted tumours, so called when their contents are of the consistence of honey; but when this is of the consistence of paste, they are called atheromata. See the articles ATHEROMA and TUMOUR.

MELIDA, an island in the gulph of Venice, situated on the coast of Dalmatia, subject to the republic of Ragusa: east long 18° 30′, north lat. 42° 30′.

MELILOT, *melilotus*, is by Linnæus accounted a species of trifolium. See the article TRIFOLIUM.

Melilot is scarce ever given internally, but externally used it is a great emolli-

ent, resolvent, and digestive. It is a good ingredient in cataplasms and fomentations, and also in clysters. It used to be an ingredient in the plaster, employed in dressing blisters; but it is now left out of that composition. The flowers are recommended by some in infusion, as a remedy for the fluor albus.

MELINDA, the capital of the province of the same name, and of all the Portugueze settlements on the coast of Malabar, in Africa: east long. 39°, south lat. 3°.

MELINUM, in natural history, the name of an earth, famous in the earliest ages of painting, being the only white of the great painters of antiquity; and, according to Pliny's account, one of the three colours with which alone they performed all their works. It is a fine, white, marly earth, of a very compact texture, yet remarkably light; a sort of texture which must render any earth fit for the painter's use, that is of a proper colour. It is frequently found forming a stratum in the earth, lying immediately under the vegetable mould. It is of a very smooth, but not glossy surface, is very soft to the touch, adheres firmly to the tongue, is easily broken between the fingers, and stains the skin in handling. It melts readily in the mouth, and is perfectly fine, leaving not the least grittiness between the teeth. Thrown into water, it makes a great bubbling and loud hissing noise, and moulders away into a fine powder. It does not ferment with acids, and suffers no change in the fire. These are the characters by which the melinum of the antients is distinguished from all the other white earths. It is still found in the same place from whence the painters of old had it, which is that from whence it has its name, the island of Milo, called Melos by the Greeks, and is common in most of the adjacent islands. It has been of late tried here as a paint, and is found not to make so bright a white as the other substances now in use among the painters, but seems not liable, like them, to turn yellow; and if so, would be worth the consideration of persons in the colour trade, especially as it may be had in any quantities for carriage.

MELISSA, BAUM, in botany, a genus of the didynamia gymnospermia class of plants, with a monopetalous ringent flower, the lower lip of which is divided into three segments, whereof the middle one is cordated: the seeds are four in number, and contained in the bottom of the cup. Baum is greatly esteemed, among the common people, as good in disorders of the head and stomach; but it is less regarded in the shops. It is most conveniently taken in infusion by way of tea; the green herb is greatly better than the dry, which is contrary to the general rule in relation to other plants.

MELITENSIS TERRA, *earth of Malta*, in the materia medica, an earth of which there are two very different kinds, the one of the genus of the boles, the other of the marles. The latter is that known by medicinal authors under this name; the former is the Malta earth now in use: but both being brought from the same place, are confusedly called by the same name. The maltese marle, which is the terra melitensis of medicinal authors, is a loose, crumbly, and very light earth, of an unequal and irregular texture, and when exposed to the weather, soon falls into fine soft powder; but when preserved and dried, it becomes a loose, light mass, of a dirty white colour, with a greyish cast: it is rough to the touch, adheres firmly to the tongue, is very easily crumbled to powder between the fingers, and stains the hands. Thrown into water it swells, and afterwards moulders away into a fine powder. It ferments very violently with acid menstruums. Both kinds are found in great abundance in the island of Malta, and the latter has been much esteemed as a remedy against the bites of venomous animals, but with how much justice we cannot say. The other has supplied its place in the german shops, and is used there as a cordial, a sudorific, and astringent. See BOLE.

MELITITES, in natural history, an indurated clay, so called from its yellowish or honey-like colour. See LAPIS.

MELITTIS, in botany, a genus of the didynamia angiospermia class of plants, the upper lip of whose cup is emarginated; the upper lip of its flower is plane, and the lower one crenated.

MELIUS INQUIRENDUM, in law, a writ that lies for a second inquiry to be made of what lands, &c. a man died seized; when partiality is suspected upon the writ diem clausit, &c.

MELLE, a town in the circle of Westphalia, in Germany, ten miles south-east of Osnaburg, subject to the elector of Cologn.

MEL-

MELLER, a large lake of Sweden, on the north ſide of which ſtands the capital city of Stockholm: it is eighty miles long, and thirty broad.

MELLILA, a port-town on the coaſt of Barbary, in the province of Fez: weſt long. 3°, and north lat. 35° 50′.

MELNICK, a town of Bohemia, twenty miles north of Prague.

MELOCHIA, in botany, a genus of the monadelphia-pentandria claſs of plants, the flower of which conſiſts of five large petals, vertically cordated; and its fruit is a roundiſh capſule with five cells, in each of which is a ſingle roundiſh ſeed.

MELODY, in muſic, the agreeable effect of different ſounds, ranged and diſpoſed in ſucceſſion; ſo that melody is the effect of a ſingle voice or inſtrument, by which it is diſtinguiſhed from harmony. See the article HARMONY.

However, the term melody is chiefly applicable to the treble, this being chiefly diſtinguiſhed by its air.

MELOE, the OIL-BEETLE, in zoology, a genus of inſects, of the order of the coleoptera; the antennæ of which are ſlender and filiform; the exterior wings are dimidiated, and there are no interior ones. See INSECTS and SCARABÆUS.

MELON, *melo*, in botany, is accounted only a ſpecies of cucumber. See the article CUCUMBER.

Melon-ſeed is eſteemed cooling and diuretic; being poſſeſſed of the ſame virtues with the other cold ſeeds, as they are called; and together with them is uſed in emulſions, and in ſome ſhop-compoſitions.

MELOTHRIA, in botany, a genus of the triandria-monogynia claſs of plants, the corolla whereof is compoſed of a ſingle rotated petal; the tube is of the length of the cup, and every where grows to it; the limb is plane, and is divided into five very obtuſe ſegments, broadeſt towards the edge; the fruit is an oval, oblong body, divided within into three parts, and containing a number of oblong, compreſſed ſeeds.

In Canada, Virginia, and Jamaica, where this fruit commonly grows, it is pickled for the table.

MELTING-CONE, in aſſaying, is defined by Cramer to be a ſmall veſſel made of copper or braſs, of a conic figure, and of a nicely poliſhed ſurface within; the uſe of which is to receive melted metals, and ſerve for their precipitation, which is effected, when two bodies melted together, and yet not mixing perfectly with one another in the fuſion, ſeparate in the cooling into two ſtrata, on account of their different ſpecific gravity. See the article PRECIPITATION.

This precipitation might be made in the ſame veſſel in which the fuſion is performed; but then the melting-pot or crucible muſt be broken every time to get it out, whereas the conic ſhape, and poliſhed ſurface of this veſſel, makes it eaſily got out without any violence. The ſhape of this veſſel is alſo of another uſe in the operation; for, by means of it, the heavy matter, ſubſiding to a point, is formed into a perfect and ſeparate regulus, even where the whole quantity, as is very frequently the caſe, has been but very ſmall. When the quantity of the melted matter is great, it is common to uſe, inſtead of this cone, a large braſs or iron-mortar, or any other conveniently ſhaped braſs or iron-veſſel. It is neceſſary, when the cone is of braſs, to be cautious that it be not made too hot; for the brittleneſs of that metal, when hot, makes it eaſily break, on the ſtriking with any force on that occaſion, to make the melted maſs fall out.

Theſe, and all other moulds for the receiving melted metals, muſt always be well heated before the maſs is poured into them, leſt they ſhould have contracted a moiſture from the air, or have been wetted by accident; in which caſe the melted metal will be thrown out of them with great violence and danger. They ought alſo to be ſmeared over with tallow on their inſide, that the regulus may be the more eaſily taken out of them, and the ſurface of the mould not corroded by the melted maſs poured in. If a very large quantity of a metal is, however, to be received into them, and eſpecially, if any thing ſulphureous have place among it, this caution of tallowing the moulds does not prove ſufficient; for the large quantity of the maſs makes it continue hot ſo long, that this becomes but a ſlight defence to the ſurface of the mould. In this caſe the aſſayer has recourſe to a lute, reduced to a thin pap with water, which being applied in form of a very thin cruſt, all over the inſide of the cone, or mould, ſoon dries up indeed, but always preſerves the ſides of the veſſel from the corroſion of the maſs.

MEMBER, in architecture, denotes any part of a building; as, a frieze, corniche, or the like. This word is alſo

fometimes ufed for the moulding. See the article MOULDING.

MEMBER, in grammar, is applied to the parts of a period or fentence. See the articles PERIOD, SENTENCE, &c.

MEMBER *of parliament*. See the article PARLIAMENT.

MEMBERS, in anatomy, the exterior parts arifing from the trunk or body of an animal.

MEMBERED, or MEMBRED, in heraldry, is where the legs or feet of an eagle, griffin, or other bird, are of a different colour from the reft of the body.

MEMBRANE, in anatomy, a pliable texture of fibres, interwoven together in the fame plane.

The membranes differ in thicknefs, according to the fmalnefs of their fibres, or the number of their planes. Thefe particular planes are termed laminæ, and are diftinguifhed into internal, external, and middle. The difference of membranes, in general, depends on that of the fibres of which they are compofed. Small portions of membranes, efpecially when they are very thin, are called pellicles; and fome membranaceous laminæ are united together by the intervention of a particular fubftance, compofed of this fort of pellicles, and called the cellular or fpungy fubftance.

The membranes of the body are various, and varioufly denominated: fuch are the peritonæum, pericardium, pleura, &c. Thofe which ferve as integuments, or covers of veffels, are called tunics or coats; and thofe which cover the brain, are called meninges. The mufcles too are each enclofed in a peculiar membrane. The ufe of the membranes is to cover and wrap up the parts, and ftrengthen them; to fave them from external injuries; to preferve the natural heat; to join one part to another; to fuftain fmall veffels, and the nerves which run thro' their duplicatures; to ftop the returning of the humours in their veffels, as the valves ftop the returning of the blood in the veins and heart; of the chyle in the thoracic duct, and of the lympha in the lymphatic veffels.

MEMBRANOSUS, in anatomy, a mufcle otherwife called fafcia lata. See the article FASCIA.

MEMBRED, or MEMBERED, in heraldry. See the article MEMBERED.

MEMBRILLO, a town of Spain, fourteen miles fouth of Alcantara.

MEMECYLON, in botany, a genus of the octandria-monogynia clafs of plants, the flower of which confifts of four petals, and its fruit is a berry.

MEMEL, a port-town of Poland, feventy miles north of Koningfberg: eaft long. 21° 30′, north lat. 56°.

MEMMINGEN, a city of Germany, 25 miles fouth of Ulm.

MEMOIRS, in matters of literature, a fpecies of hiftory, written by perfons who had fome fhare in the tranfactions they relate; anfwering to what the Romans called commentarii, commentaries.

The journals of the proceedings of a literary fociety, or a collection of matters tranfacted therein, are likewife called memoirs.

MEMORY, *memoria*, a faculty of the human mind, whereby it retains or keeps the ideas it has once perceived. See the article IDEA.

Memory, fays Mr. Locke, is, as it were, the ftore-houfe of our ideas; for the narrow mind of man not being capable of having many ideas under view at once, it was neceffary to have a repofitory in which to lay up thofe ideas which it may afterwards have ufe of. But our ideas being nothing but actual perceptions in the mind, which ceafe to be any thing when there is no perception of them; this laying up of our ideas in the repofitory of the memory, fignifies no more but this; that the mind has a power, in many cafes, to revive perceptions it has once had, with this additional perception annexed to them, that it has had them before. And it is by the affiftance of this faculty, that we are faid to have all thofe ideas in our underftandings which we can bring in fight, and make the objects of our thoughts, without the help of thofe fenfible qualities which firft imprinted them there.

Attention and repetition help much to the fixing ideas in our memories: but thofe which make the deepeft and moft lafting impreffions, are thofe which are accompanied with pleafure and pain. Ideas but once taken in and never again repeated, are foon loft; as thofe of colours in fuch as loft their fight when very young.

The memory of fome men is tenacious even to a miracle: but yet there feems to be a conftant decay of all our ideas, even of thofe which are ftruck deepeft; and in minds the moft retentive: fo that if they be not fometimes renewed, the

print

print wears out, and at at last there remains nothing to be seen.

Those ideas that are often refreshed by a frequent return of the objects or actions that produce them, fix themselves best in the memory, and remain longest there: such are the original qualities of bodies, *viz.* solidity, extension, figure, motion, *&c.* and those that almost constantly affect us, as heat and cold.

In memory, the mind is oftentimes more than barely passive; for it often sets itself on work to search some hidden ideas; sometimes they start of their own accord; and sometimes tempestuous passions tumble them out of their cells. This faculty other animals seem to have to a great degree, as well as men, as appears by birds learning of tunes, and their endeavour to hit the notes right. For it seems impossible that they should endeavour to conform their voices (as it is plain they do) to notes whereof they have no idea.

Defect of MEMORY, is a misfortune which may proceed from falls, contusions, passions of the mind, *&c.* If the memory is much impaired, without any external cause, it is a fore-runner of an apoplexy, and if it proceeds from malignant acute diseases, or poisons, it is incurable.

When the cure is judged practicable, Heister recommends a moderate and strengthening diet, together with carminative, aromatic, cephalic, and stomachic medicines. Spirit of lavender, hungary-water, Hoffman's balsam of life, and sal volatile oleosum, are also proper, used either internally or externally; likewise oil of cinnamon with sugar, native cinnabar, or cinnabar of antimony; but being hot medicines, they should be used with caution. Externally, oil of myrrh should be applied to the temples, and vertex. Cubebs are deemed specific; but young people ought to use them with caution. In old persons, amber should be mixed with the other medicines.

Local MEMORY, among orators, is nothing but the associating the different heads to be handled, with the objects before the speaker's eyes; so that by only looking around him, he is put in mind of what he is to say.

Artificial MEMORY, *memoria technica*, a method of assisting the memory, by forming certain words, the letters of which shall signify the date or æra to be remembered. In order to this, the following series of vowels, diphthongs, and consonants, together with their corresponding numbers, must be exactly learned; so as to be able at pleasure to form a technical word, that shall stand for any number, or to resolve such a word already formed.

a	*e*	*i*	*o*	*u*	*au*	*oi*	*ei*	*ou*	*y*
1	2	3	4	5	6	7	8	9	o
b	*d*	*t*	*f*	*l*	*s*	*p*	*k*	*n*	*z*

The first five vowels, in order, naturally represent 1, 2, 3, 4, 5; the diphthong *au* = 6, as being composed of *a* and *u*, or 1 + 5 = 6; and for the like reason, *oi* = 7, and *ou* = 9. The diphthong *ei* will easily be remembered for 8, as being the initials of the word. In like manner, where the initial consonants could conveniently be retained, they are made use of to signify the number, as *t* for 3, *f* for 4, *s* for 6, and *n* for 9. The rest were assigned without any particular reason, unless that possibly *p* may be more easily remembered for 7 or septem, *k* for 8, or ὀκτω, *d* for 2, or duo; *b* for 1, as being the first consonant, and *l* for 5, being the roman letter for 50, than any others that could have been put in their places.

It is farther to be observed, that *z* and *y* being made use of to represent the cypher, where many cyphers meet together, as 1000, 1000000, *&c.* instead of a repetition of *a z y z y z y*, &c. let *g* stand for 100, *th* for a thousand, and *m* for a million. Thus *ag* will be 100, *ig* 300; *oug* 900, *&c.* *ath* 1000, *am* 1000000, *loum* 59000000. *&c.*

Fractions may be set down in the following manner: let *r* signify the line separating the numerator and denominator, the first coming *before*, the other *after* it; as *iro* $\frac{3}{4}$, *urp* $\frac{5}{7}$, *pourag* $\frac{79}{100}$, *&c.* When the numerator is 1 or unit, it need not be expressed, but begin the fraction with *r*; as *re* $\frac{1}{2}$, *ri* $\frac{1}{3}$, *ro* $\frac{1}{4}$, *&c.* So in decimals, *rag* $\frac{1}{100}$, *rath* $\frac{1}{1000}$.

This is the principal part of the method, which consists in expressing numbers by artificial words. The application to history and chronology is also performed by artificial words. The art herein consists in making such a change in the ending of the name of a place, person, planet, coin, *&c.* without altering the beginning of it, as shall readily suggest the thing sought, at the same time that the beginning of the word, being preserved, shall be a leading or prompting

syllable

fyllable to the ending of it fo changed. Thus, in order to remember the years in which Cyrus, Alexander, and Julius Cæfar, founded their refpective monarchies, the following words may be formed; for Cyrus, Cy*ruts*; for Alexander, Alex*ita*; for Julius Cæfar, Juli*os*. *Uts* fignifies, according to the powers affigned to the letters beforementioned, 536; *ita* is 331, and *os* is 46. Hence it will be eafy to remember, that the empire of Cyrus was founded 536 years before Chrift, that of Alexander, 331, and that of Julius Cæfar 46. This account is taken from a treatife, entitled, a New method of Artificial Memory; where the reader will find feveral examples in chronology, geography, &c. of fuch artificial words difpofed in verfes, which muft be allowed to contribute much to the affiftance of the memory, fince being once learned, they are feldom or never forgot. However, the author advifes his reader to form the words and verfes himfelf, in the manner defcribed above, as he will probably remember thefe better than thofe formed by another.

Be this as it will, we fhall here give his table of the kings of England fince the conqueft; where one thoufand being added to the italics in each word, expreffes the year when they began their reigns. Thus,

Will-con*fau*, Ruf*koi*, Hen*rag*
Steph*bil* & Henfec*buf*, Rich*bein*, J*ann*, Heth*das* & Ed*doid*.
Edfe*typ*, Edter*tep*, Rife*tois*, Hefo*toun*, Hefi*fad*que.
Henfi*fed*, Edquar*fauz*, Efi R*okt*, Henfep*feil*, Henoc*lyn*.
Edfex*los*, Mary*lut*, Els*luk*, Jam*fyd*, Caroprim*fel*.
Carfec*fok*, Jam*feif*, Wil*feik*, An*pyd*, Geo*bo-doi*.

MEMPHIS, once the capital of Egypt, ftood on the weft fide of the Nile, almoft oppofite to Grand Cairo.

MENAN, a great river of the further India, which rifing north of Siam, runs through that kingdom, and falls into a bay of the Indian ocean below Bancock.

MENCHOU, a town of France, in the province of Champaign, fixteen miles north-eaft of Chalons.

MENDELSHAM, a market-town of Suffolk, fixteen miles eaft of Bury.

MENDICANTS, or begging fryars, feveral orders of religious in popifh countries, who having no fettled revenues, are fupported by the charitable contributions they receive from others. This fort of fryars began in the thirteenth century; when the Waldenfes making a profeffion of renouncing their eftates, and leading a life of poverty, gave rife to this inftitution. Two of that fect, Bernard and Durand, fet up a congregation called the poor catholics; thofe who afterwards followed their example are, the dominicans, francifcans, auguftins and carmelites.

MENDIP, a name given to feveral hills near the city of Wells, in Somerfetfhire, in which are lead mines.

MENGRELIA, a province of afiatic Turky, fituated on the north-eaft part of the Euxine fea, between Georgia and Circaffia, where the Turks purchafe boys and young women for their feraglios.

MENIALS, in law books, domeftic or houfhold-fervants, who live under their lord or mafter's roof.

MENIN, a little fortified town in Flanders, eight miles north of Lifle.

MENINGES, or MENYNGES, in anatomy, a name given to the dura and pia mater of the brain. See the article DURA MATER, &c.

MENIPPEAN, in poetry, a kind of fatyr, confifting of profe and verfe intermixed.

MENISCUS, in optics, a lens convex on one fide, and concave on the other. See the article LENS.

For finding the focus of a menifcus, the rule is: as the difference of the femidiameters of the concavity and convexity, to the femidiameter of the concavity; fo is the diameter of the convexity to the focal diftance.

MENISPERMUM, VIRGINIAN IVY, in botany, a genus of the hexandria-trigynia clafs of plants, the corolla whereof confifts of fix ovato-oblong, obtufe, hollow, erecto-patent petals; the fruit is compofed of three oval berries, each containing a fingle cell, and in it a large, fingle, lunated, compreffed feed.

It is to be obferved, that the parts of fructification vary extremely in this genus.

MENNONITES, a fect of baptifts in Holland, fo called from Mennon Simonis of Friezeland, who lived in the fixteenth century. This fect believe, that the New Teftament is the only rule of faith; that the terms Perfon and Trinity are not to be ufed in fpeaking of the Father, Son, and Holy Ghoft; that the firft man was not created perfect; that it is unlawful to fwear or to wage war upon any occafion; that infants are not the proper fubjects of bap-

baptism; and, that ministers of the gospel ought to receive no salary. They all unite in pleading for toleration in religion, and debar none from their assemblies who lead pious lives, and own the scriptures for the word of God. The mennonites meet privately, and every one in the assembly has the liberty to speak, to expound the scriptures, to pray and sing. They assemble twice every year, from all parts of Holland, at Rynsbourg, a village about two leagues from Leyden, at which time they receive the communion, sitting at a table, where the first distributes to the rest; and all sects are admitted, even the roman catholics if they please to come.

MENOLOGY, the greek calendar, in which the lives of the saints in short, or barely their names, are cited; answering nearly to the martyrology of the latin church. See MARTYROLOGY.

MENSA, in law-books, a term that includes in it all patrimony, and necessaries for livelihood.

MENSALS, *mensalia*, in church-history, such livings as were formerly united to the tables of religious houses, and hence called mensal benefices. See BENEFICE.

MENSES, FLOURS, COURSES, *catamenia*, in medicine, the monthly evacuations from the uterus of women not with child and not giving suck.

Among the natural actions which prepare proper juices and matter for carrying on the vital motions, may be reckoned this menstrual purgation of women, since by means thereof the superfluous and redundant blood is evacuated, that what remains in the veins may circulate with greater freedom, and be the more effectually depurated. This evacuation is occasioned by the redundance of that fluid in women and the peculiar structure of the uterus; and as it is of great importance to health, so it is the means by which the foetus is nourished. The antient physicians, and the generality of the modern ones, ascribe the periodical return of this flux to the influence of the moon, or to the lunar phases. The quantity of blood thus evacuated cannot be exactly and accurately ascertained, for it varies in women of different ages, methods of life, and constitutions. About the first eruption of the menses the quantity discharged is generally but small. Lean women, and those who abound in blood, evacuate more than such as are fat and of a cold constitution; and those who are addicted to luxury and idleness, a larger quantity than those who live upon low and slender diet, or use much exercise. The menstrual blood is said to be evacuated both from the minute vessels of the uterus and vagina; it is, however, a great controversy among anatomists, whether this blood is discharged from the veins of the uterus alone, or those of the vagina, exclusive of the uterus. The menses generally make their first eruption in girls about fourteen years of age, and cease between forty and fifty. When this evacuation begins, the body is frequently freed from numberless disorders arising from the redundance of serum before generated; and when it ceases, a large number of disorders are generally produced.

Immoderate flux of the MENSES. Every large flux of blood from the uterus is not to be esteemed noxious, but such only as is attended with loss of strength, which brings on other symptoms, such as want of appetite, crudities from indigestion, a sensation of weight near the region of the stomach, an ill colour in the face, a languid pulse, often with a gentle heat, an oedematous swelling of the feet, and a disturbed sleep without refreshment. Sometimes the menses flow in too great plenty and with impetuosity at the usual period; sometimes twice or oftener in a month; sometimes again they continue several days longer than ordinary. This flux sometimes consists of thin florid blood, which happens chiefly in abortions and from a retention of pieces of the secundines, which keep the mouths of the vessels open; sometimes there are coagulated and clotted masses, like flesh which come away with the blood, of the size of an egg, which is occasioned by a stoppage of the menses for two or three months. At other times the blood is grumous, coagulated and black, generally on the first days of childbed, in slender and plethoric subjects. When the patient is cachectic, and the flux continues long, it is then watry and mucid; in scorbutic persons it is watry and fetid, with acrimony and pain, in the younger sort, before child-bearing; if the evacuation be immoderate, it is commonly followed by a fluor albus.

The cause may be referred to a copious and impetuous afflux of the blood to the uterus, and an unequal and impeded reflux by the veins, which distending and relaxing the uterine vessels, make the ori-

fices too wide, or rend and corrode them, by which the blood flows too freely: this may happen from a plethora, or when there has been a long ſuppreſſion, or an abortion, or a difficult labour. It generally happens to women about the fiftieth year, when the menſes are going to leave them, and not always without danger. If the body is cacochymic, or ſcorbutic, or full of bad humours, or afflicted with the venereal diſeaſe, the caſe is dangerous and troubleſome. It is produced by a ſedentary life, by too frequent an uſe of ſalt, acrid and ſeaſoned meats, by ſpirituous liquors, by violent agitations and paſſions of the mind, from loſſes, love, anger, &c.

The cure, according to Aſtruc, ſhould reſpect the reſtraining a preſent flux. It ſhould begin with reſt if convenient, in bed; the patient lying on her back and kept as ſilent as poſſible: ſhe ſhould be bled in the arm in proportion as her conſtitution, ſtrength and the urgency of the ſymptoms will admit. Let her fare ſlenderly on veal and chicken-broth, fiſh-ſoops, and drink a ptiſan of nettle-tops, yarrow and plantane, with orange peel, or of the greater comfrey; if the patient is hot and bilous, with linſeed. If theſe fail, let her take twenty-five or thirty grains of roch-alum in ſubſtance, with a draught of an aſtringent decoction. In more deſperate caſes the uterus may be ſyringed with a ſyringe made for that purpoſe, with a decoction of plantane, red roſes, and yarrow, with vinegar or powder of roch alum. If the menſes appear in breeding women, the true and only remedy is opium, which muſt be given freely till the intention is obtained.

Suppreſſion of the MENSES. Boerhaave obſerves, that in a ſuppreſſion of the menſes there is a plethora, with a liſtleſſneſs to motion, a heavineſs, a paleneſs, a pain of the loins and of the groin; all the functions, whether natural, vital, or animal, are depraved; ſometimes the menſes will force a way through the eyes, ears, noſtrils, gums, the ſalival ducts, the œſophagus, from the alvus, bladder, breaſts, ſkin, wounds or ulcers. Hence often ariſes a depravation of all the viſcera, as alſo diſeaſes without number, partly from a putrefaction already begun, and partly from the hurt which the veſſels have received.

From this diſorder, Aſtruc obſerves, proceed want of appetite, the pica malacia, or a depraved appetite. If it is habitual and obſtinate, a ſchirrus or dropſy of the womb are to be feared, or a rupture of ſome blood veſſel, eſpecially of the lungs. It is not ſo dangerous when the uterus is not infarcted, or when there is no other ſymptom of the menſes. If this diſeaſe is attended with the fluor albus, it may become habitual, and from yellow become green and acrid, corroding the uterus, and laying the foundation of a dropſy therein.

Things which retard the menſes are immoderate cold, ſorrow, a ſudden fright, too great evacuations, incraſſating diet, a crudity of the humours, acids, and aſtringent medicines.

This diſorder, according to Sydenham, is to be cured in the ſame manner as the hyſteric affection, but if the remedies for that fail, the patient muſt take every morning five ſpoonfuls of hyſteric julep with twelve drops of ſpirit of hartſhorn; and every night one ſcruple of powder of myrrh camphorated, made into a bolus or pills with the ſyrup of orange-peels. Allen recommends cantharides and camphor: the doſe is from two grains to ſix. Hoffman directs chalybeats, or pills made of aloes, myrrh, ſaffron, amber, caſtor, and round birthwort. Pitcairn thinks mercury more efficacious than ſteel. If the fluids are inclinable to ſtagnate, their fluidity may be preſerved by fomentations and frictions of the feet, by opening a vein in the foot, and bleeding elſewhere, by giving uterine purges, by emmenagogues, by plaſters, fomentations, liniments, vapours and heat, by ſtrengthening the veſſels debilitated with a plethora by chalybeats and aſtringents. See the articles FOMENTATION, FRICTION, EMMENAGOGUES, LINIMENT, &c.

MENSTRUUM, in chemiſtry, any body which in a fluid or ſubtiliſed ſtate is capable of interpoſing its ſmall parts betwixt the ſmall parts of other bodies, ſo as to divide them ſubtily, and form a new uniform compound of the two. Hence chemiſts have divided menſtruums into ſolid and fluid. Dry or ſolid menſtruums may again be divided into five claſſes; which, according to Boerhaave, are as follow. 1. The ſix metals, gold, lead, ſilver, copper, iron and tin, which act upon one another after being fuſed in the fire, and may be intimately mixed, ſo as to make an apparently homogeneous maſs, every particle of which holds the ſame propor-

tion of a different metal as the whole. For if ten ounces of silver be thus mixed with an ounce of gold, and a grain of this mass be given to an assay-master, he will discover that it contains one eleventh part gold and ten parts silver. 2. The semi-metals, as antimony, bismuth, cinnabar, marcasites and zink, which, when melted, mix with one another or with metals; but when thus mixed they are no longer malleable, but may easily be reduced to powder. 3. The dry salts, as alum, borax, nitre, sal-ammoniac, sea-salt, vitriol, fixed alkali, and mercury-sublimate, which may be subtily divided by fire, and intimately mix with one another, with metals, semi-metals, and other things. 4. Hard fossil sulphureous bodies, as sulphur vivum, common brimstone, arsenic, orpiment and cobalt. 5. The fossil bodies, called by refiners cements, which consist of salts, sulphur and brick reduced to dry powders and strowed betwixt plates of metals, in order to raise their colour, or separate one metal from another.

Some menstruums being left to themselves, after solution concrete into an hard mass, which, though compounded, appears of an uniform simple nature. In this manner, if melted lead be mixed with tin, they unite, as water with water, or mercury with mercury. The case is the same in all the metals, and in some of the semi-metals. Thus if a scruple of regulus of antimony be added to a pound of melted tin, the mass when cold will appear uniform, but become entirely brittle: so fixed alkali unites with sand in the fire; and sulphur and mercury, by being ground together, turn to a black and dry powder, which being sublimed produces an apparent simple body called cinnabar. Many become an hard, and sometimes a dry body. Thus almost all the menstruums of metals unite with their respective metals into solid vitriols: and thus strong distilled vinegar, when it has dissolved shells, chalk, and stony substances, separates from its water, and together with the body it dissolves, forms a dry hard mass. See SOLUTION.

Numerous menstruums have a liquid form before they act as solvents; as vinegar, water, saline, acid, alcaline and compounded spirits, alcaline oils per deliquium, &c. some menstruums become liquid after the solution, and continue so with the solvent. Thus in the dissolution of five of the metals with simple mercury a soft paste is produced, which may indefinitely be diluted by the addition of more mercury, but there is scarcely any known method of restoring this amalgama to its solidity. All the liquid menstruums, after having dissolved metals in a large proportion, cannot easily be dried; whence many have imagined these solutions to be fixed metallic oils, and in vain sought secrets in them.

It is now easy to observe that many menstruums unite bodies as well as separate them; for frequently after the dissolution the particles of the menstruum presently join with those of the solvent, and produce a new compound, often very different from the nature of the simple resolved body. The parts however of the solvent, after its concretion, no longer touch one another, but are separated by the interposition of the particles of the matter dissolved. And the particles which before constituted the solvend are separated by the interposition of the particles of the solvent. Hence it is plain that the parts of the menstruums apply themselves to the parts of the solvend; and a certain cause is here required to make the particles of the solvent fly from one another and approach the particles of the solvend, rather than remain in their former situation. The like cause seems to be required to make the particles of the solvend, now separated, remain united with the parts of the menstruum, rather than suffer the dissolving and dissolved particles to unite by their natural affinity into homogeneous bodies. This cause must be sought in the solvend as well as in the solvent, for the action is reciprocal. Thus while aqua regia dissolves thrice its weight of gold into a yellow liquor, the particles of gold are united with the aqua regia, and remain suspended in it, though gold be eighteen times heavier than aqua regia. Whence there must be a mutual corresponding power between the particles of the gold and aqua regia, whereby they act upon, embrace and detain each other, otherwise the particles of gold would fall to the bottom, the saline particles rest upon them, and the water float over both. If we were to deduce the cause from similitude of substance, the action of dissolution seems to be performed by a certain power of the parts of the menstruum to attract the dissolved parts rather than to repel them; and is not a m

chanical action, or unfriendly commotion, but rather an appetite of union. Thus, in a violent solution, the agitation, heat, hissing and tumult cease when all the parts of the solvend have united with those of the solvent, as appears in throwing a piece of iron into weak aqua fortis.

The whole solvent never acts at once on the whole solvend, only those particles of the solvend which touch some others of the solvent act first; and these being separated, fresh particles of the menstruum apply themselves to others of the solvend: therefore part of the menstruum acts upon that part of the body which it strikes off and separates, but the conflict made in this separation excites a greater motion in the menstruum, by which means other parts of the menstruums are agitated and applied to other parts of the solvend.

Fire excites, promotes, and increases the action of menstruums; for in extreme cold, solutions are either not made or made but slowly, but they are soon performed by the assistance of heat: some menstruums require a strong heat, as mercury, before it will dissolve metals: some a smaller; thus sal armoniac, sea salt, and salt of tartar easily dissolve in water: some menstruums act with a moderate heat, but lose their dissolving power, or even acquire a power of coagulating, by a stronger; thus warm water dissolves the white of eggs, which boiling water coagulates. This effect of fire seems to be produced, 1. by impelling, moving and agitating the menstruum in the manner of a mere mechanical motion. 2. By its general power of expanding the substance of all bodies. 3. By separating the parts so as to set them farther asunder. In most cases the heat is increased during the solution, and even the action of those menstruums is augmented by heat, which generate a great degree of cold in the solution; thus sal ammoniac dissolves soonest in warm water.

The above being part of the doctrine of Boerhaave concerning menstruums, we shall subjoin the following axioms and canons in relation to the same subject from Dr. Shaw's chemical lectures.

That author having derived these axioms from experiments, thence deduces the canons in the manner following. 1. That water is a menstruum which of itself dissolves little more than salts, but being assisted by acids, dissolves earths, and even metals themselves. See the article ACID *menstruums*.

Hence a general rule of practice might be drawn for making water an almost universal menstruum; thus, by the addition of a fixed alkaline salt, it dissolves oil into a soap; by the addition of alcohol, it extracts the resinous tinctures of vegetables; and in this manner it might be proper to run through the different subjects of the vegetable, animal and mineral kingdoms, and form tables of the solutive powers of water, separate, and in conjunction. 2. That such tables may be readily formed of the dissolving power of all known menstruums, to shew, by inspection, in what time, in what proportion, and with what degree of heat all solvents perform their actions; which being once reduced to a certainty, would greatly facilitate and improve the practice of chemistry. 3. That the power of alcohol, as a menstruum, is chiefly limited to resins and oils, but by certain additions may be extended, as was said of water, so as to become an almost universal solvent. Thus, by the addition of water, it becomes brandy, or spirit which extracts many tinctures that pure water and pure alcohol will not separately extract. Whence we have a good instruction for attempting a new set of menstruums by mixture, or the composition of two or three simple solvents: and if the requisite care and skill were employed in this matter, many useful discoveries might be justly expected from it. Indeed the mixing of two menstruums may sometimes destroy the virtue of both: thus spirit of nitre and simlpe water will each of them separately dissolve the calculus humanus, but not touch it when they are mixed: but this instance is only particular, and there are a large number producible on the contrary side, which may rationally recommend a further prosecution of this enquiry. 4. That metals are soluble in oils and acid spirits, so as not to be easily discovered therein: whence a rule may be drawn for a prudent suspension of the judgment, and a rational distrust of the senses, in chemical operations; and again, a caution derived against being imposed on by vain pretences of alchymists. 5. That the power of a menstruum is not to be judged of by its innocency with regard to the animal body; the acid spirit of bread is innocent and wholesome, yet capable of dissolving coral and gems. Pure oil-olive will

will diſſolve lead and tin. The white of an egg boiled hard, and ſuffered to run *per deliquium*, diſſolves the tough body of myrrh. 6. That the action of menſtruums depends upon a certain ſecret and reciprocal relation betwixt the ſolvent and ſolvend, ſcarce cognizable by the direct ſenſes, nor hitherto well made out by inſtances and induction. 7. That menſtruums have not their full action unleſs reduced to a fluid or ſubtile ſtate. Water in the firm and ſolid form of ice, does not act on ſalts, but they ſoon begin to diſſolve each other upon contact. Metals do not act upon metals in the way of ſolution till they are fuſed; nor does ſulphur diſſolve quickſilver till they are both reduced either to a fluid or very ſubtile ſtate by triture or melting; whence to promote the actions of menſtruums, we are directed to reduce both the ſolvent and ſolvend to minute parts, or the neareſt poſſible to a fluid ſtate, whether by heat, triture, fuſion, or otherwiſe. 8. That quickſilver is a true ſolvent of metals, ſo as to drink them in as water drinks in ſalts; by which means one metal may be readily united with another in any proportion by ſimple triture; and by this means, amalgamation and many operations in the ſublimer metallurgy are performed. 9. That acid ſpirits are not equally proper menſtruums to all the metals: thus ſpirit of nitre, though it diſſolves the reſt, will not diſſolve gold. 10. That all bodies in nature may become menſtruums to one another, each of them being, by ſome means or other, capable of having their parts uniformly interpoſed betwixt the ſmall parts of any of the reſt; thus even metals may, by art, be made to diſſolve in water, as we evidently ſee from numerous ſolutions of metals in acid ſpirits: theſe ſpirits being no more than water charged with the fine or more volatile parts of ſalts. 11. That the cauſe commonly aſſigned of ſolution, *viz.* the admiſſion of the fine particles of one body into the pores of another, whoſe figure fits them for their reception, is not juſt or adequate, but hypothetical and ill preſumed; ſince we find that ſome bodies will uniformly diſſolve their own quantity of others, as water does of Epſom-ſalt, alcohol of eſſential oils, mercury of metals, one metal of another, &c. whereas the ſum of the pores or vacuities of every body, muſt be neceſſarily leſs than the body itſelf, and conſequently thoſe pores cannot receive a quantity of matter equal to the body wherein they reſide. 12. That the diſſolving power of water may be immenſely increaſed by means of the digeſtor, from which inſtrument there are ſolid grounds of hope that it may, under a proper regulation, greatly contribute to the improvement of chemiſtry, natural philoſophy, and arts. See the article DIGESTOR.

13. Upon the whole, it ſhould ſeem that many deſireable improvements are derivable to arts from an improvement in the buſineſs of menſtruums. The diſcovery of that common menſtruum aqua fortis, introduced the art of aſſaying, and the ſcarlet-dye. That of alcohol introduced the arts of varniſhing and japanning. Numerous pigments for painters, colours for dyers, tan-liquors for tanners, the ſtaining of bone, horn, ivory, marble, various kinds of ink, tinctures, and ſolutions in medicine, chemiſtry, and other arts, have all reſulted from the diſcovery of menſtruums; yet this ſubject ſeems almoſt as new and rich as ever, ſo that numerous other diſcoveries of the ſame kind could not exhauſt it.

Univerſal MENSTRUUM. See the article ALKAHEST.

MENSURATION, in general, denotes the act or art of meaſuring lines, ſuperficies, or ſolids. See DISTANCE, GAUGING, HEIGHT, SURVEYING, &c.

MENTHA, MINT, in botany. See the article MINT.

MENTZ, the capital of one of the electorates of the ſame name in Germany, ſituated at the confluence of the rivers Rhine and Maine: eaſt long. 8°, and north lat. 50°.

MENTZELIA, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five patent petals: the fruit is an oblong, unilocular capſule, containing a number of ſmall roundiſh ſeeds.

MENYANTHES, BUCKBEAN, in botany, a genus of the pentandria-monogynia claſs of plants, with a monopetalous funnel-like flower, divided into five deep ſegments at the limb: the fruit is an oval capſule with one cell, containing a great many ſmall ſeeds.

Buckbean, called by authors trifolium paluſtre and paludoſum, and by Tournefort nymphoides, is greatly recommended as a diuretic, in dropſical caſes; as alſo in the cure of intermittent fevers, and diſorders of the breaſt ariſing from tough

tough matter in the lungs: the general way of taking it is in a strong infusion, though many prefer the juice fresh expressed from the leaves.

MEOTIS, or PALUS MEOTIS, a sea of Turky, which divides Europe from Asia, extending from Crim Tartary to the mouth of the river Don, or Tanais.

MEPPEN, a city of Germany, in the circle of Westphalia, and bishopric of Munster: east long. 7°, north lat. 52° 55′.

MEQUENENCA, a city of Spain, in the province of Arragon, fifty miles south-east of Saragossa.

MEQUINEZ, a city of Fez, in the empire of Morocco: west long. 6°, north lat. 34°.

MERAN, or MORAN, a city in the circle of Austria and county of Tyrol: east long. 11° 15′, north lat. 46° 40′.

MERCATOR's SAILING, that performed by Mercator's chart. See the articles CHART and NAVIGATION.

MERCATOR's *projection of maps*. See the article MAP.

MERCHANT, a person who buys and sells commodities in gross, or deals in exchanges; or that traffics in the way of commerce, either by importation or exportation. Formerly every one who was a buyer or seller in the retail way, was called a merchant, as they are still both in France and Holland; but here shop-keepers, or those who attend fairs or markets, have lost that appellation.

Previous to a person's engaging in a general trade, and becoming an universal dealer, he ought to treasure up such a fund of useful knowledge, as will enable him to carry it on with ease to himself, and without risking such losses as great ill-concerted undertakings would naturally expose him to. A merchant should therefore be acquainted with the following parts of commercial learning: 1. He should write properly and correctly. 2. Understand all the rules of arithmetic that have any relation to commerce. 3. Know how to keep books of double and single entry, as journals, a ledger, &c. 4. Be expert in the forms of invoices, accounts of sales, policies of insurance, charter-parties, bills of lading, and bills of exchange. 5. Know the agreement between the money, weights and measures of all parts. 6. If he deals in silk, woollen, linen, or hair manufactures, he ought to know the places where the different sorts of merchandizes are manufactured, in what manner they are made, what are the materials of which they are composed, and from whence they come, the preparations of these materials before working up, and the places to which they are sent after their fabrication. 7. He ought to know the lengths and breadths which silk, woollen, or hair-stuffs, linen, cottons, fustians, &c. ought to have according to the several statutes and regulations of the places where they are manufactured, with their different prices, according to the times and seasons; and if he can add to his knowledge the different dyes and ingredients which form the various colours, it will not be useless. 8. If he confines his trade to that of oils, wines, &c. he ought to inform himself particularly of the appearances of the succeeding crops, in order to regulate his disposing of what he has on hand; and to learn as exactly as he can, what they have produced when got in, for his direction in making the necessary purchases and engagements. 9. He ought to be acquainted with the sorts of merchandize found more in one country than another, those which are scarce, their different species and qualities, and the properest method for bringing them to a good market, either by land or sea. 10. To know which are the merchandizes permitted or prohibited, as well on entering as going out of the kingdoms or states where they are made. 11. To be acquainted with the price of exchange, according to the course of different places, and what is the cause of its rise and fall. 12. To know the customs due on importation or exportation of merchandizes, according to the usage, the tarifs, and regulations of the places to which he trades. 13. To know the best manner of folding up, embaling, or tunning the merchandizes for their preservation. 14. To understand the price and condition of freighting and insuring ships and merchandize. 15. To be acquainted with the goodness and value of all necessaries for the construction and repairs of shipping, the different manner of their building, what the wood, the masts, cordage, cannons, sails, and all requisites may cost. 16. To know the wages commonly given to the captains, officers, and sailors, and the manner of engaging with them. 17. He ought to understand the foreign languages, or at least as many of them as he can attain to; these may be reduced to four; *viz.* the Spanish,

Spaniſh, which is uſed not only in Spain, but on the coaſt of Africa, from the Canaries to the Cape of Good Hope: the Italian, which is underſtood on all the coaſts of the Mediterranean, and in many parts of the Levant: the German, which is underſtood in almoſt all the northern countries; and the French, which is now become almoſt univerſally current. 18. He ought to be acquainted with the conſular juriſdiction, with the laws, cuſtoms, and uſages of the different countries he does or may trade to; and in general all the ordinances and regulations, both at home and abroad, that have any relation to commerce. 19. Though it is not neceſſary for a merchant to be very learned, it is proper that he ſhould know ſomething of hiſtory, particularly that of his own country, geography, hydrography, or the ſcience of navigation; and that he is acquainted with the diſcoveries of the countries in which trade is eſtabliſhed, in what manner it is ſettled, of the companies formed to ſupport thoſe eſtabliſhments, and of the colonies they have ſent out.

All theſe branches of knowledge are of great ſervice to a merchant who carries on an extenſive commerce; but if his trade and his views are more limited, his learning and knowledge may be ſo too: but a material requiſite for forming a merchant is, his having on all occaſions a ſtrict regard to truth, and his avoiding fraud and deceit as corroding cankers that muſt inevitably deſtroy his reputation and fortune.

Trade is a thing of ſo univerſal a nature, that it is impoſſible for the laws of England, or of any other nation, to determine all the affairs relating to it; therefore all nations, as well as Great Britain, ſhew a particular regard to the law-merchant, which is a law made by the merchants among themſelves: however, merchants and other ſtrangers are ſubject to the laws of the country in which they reſide. Foreign merchants are to ſell their merchandize at the port where they land, in groſs, and not by retail; and they are allowed to be paid in gold or ſilver-bullion, in foreign coin or jewels, which may be exported. If a difference ariſes between the king and any foreign ſtate, the merchants of that ſtate are allowed ſix months time to ſell their effects and leave the kingdom, during which time they are to remain free and unmoleſted in the[illegible] and goods. See the articles Commerce and Naval Affairs.

MERCURIAL, ſomething conſiſting of or relating to mercury. See Mercury. The efficacy of mercurial medicines depends on the extreme fineneſs and great weight of their particles, whereby they penetrate into the inmoſt receſſes of the animal ſtructure, and there remove obſtructions. However, as they tend to quicken the circulation of the blood, their uſe in hectical caſes ſeems dangerous.

MERCURIALIS, mercury, in botany, a genus of the dioecia-ennendria claſs of plants, with an apetalous flower, conſiſting only of ſtamina: the fruit is a large bilocular capſule, with a ſingle roundiſh ſeed in each cell.

MERCURIFICATION, in chemiſtry, the method of ſeparating the mercuries of metals, which is moſt eaſily effected by means of a burning-glaſs; for the metal being placed in its focus, its mercurial parts are ſaid to fly off in ſmoke, which when condenſed and collected, appears to be true quickſilver.

MERCURY, in natural hiſtory, a ſemi-metal naturally fluid, and the heavieſt of all known bodies except gold: it is ſo perfectly homogeneous and ſimple in its nature, that it is a queſtion whether gold itſelf be more ſo: when perfectly purified, it appears the ſame in all its parts, as far as our utmoſt teſts can go, till we come to that ſevere trial, the ſolar fire. It penetrates the parts of all the other metals, renders them brittle, and in part diſſolves them. It is wholly volatile in the fire, and may be driven up in vapour by a degree of heat very little greater than that of boiling water. It is the leaſt tenacious of all known bodies, for its parts ſeparate into more minute ones of the ſame figure, with the ſmalleſt force. It is, indeed, the moſt diviſible of all bodies, for the vapour, in form of which it riſes in evaporation, is almoſt too thin to be diſtinguiſhed from the ambient air, yet this is pure unaltered mercury; for if it is received into cold water, it forms itſelf again into regular round drops. Notwithſtanding a ſmall heat ſerves to evaporate mercury, yet if it be kept in a degree ſmaller than that, in a veſſel carefully cloſed, a long continuance of that heat will reduce it to a red calx in form of powder, and this may be again revived into fluid mercury by a gentle heat given it in ſtratification with charcoal-duſt. If it be placed in its crude ſtate in the focus of a great burning-glaſs,

glaſs, it is immediately diſſipated in fumes, and leaves no remainder: but if inſtead of crude mercury, this red calx be uſed, it runs into a kind of glaſs, and immediately afterwards evaporates, leaving a ſmall quantity of duſky powder behind, which, on being further urged by the ſame intenſe heat, vitrifies and flies off as the other part had done: but if this calx be expoſed upon a piece of charcoal, the effect is the ſame, as in giving it the heat of a common fire with charcoal-duſt, it runs into liquid mercury, and immediately afterwards evaporates. It appears, therefore, that mercury, ſimple as it ſeems to be, is compoſed of a vitrifiable earth, and a ſulphur, which laſt gives it the brightneſs and appearance of metal; for when robbed of this, it ceaſes to be bright and metalline, and again recovers thoſe qualities on its being added again, tho' from no other ſubſtance than charcoal. It is poſſible to calcine mercury to ſuch a degree, that it ſhall bear heating red hot in a crucible without evaporation. The penetrating power of mercury is ſo great, that in ſalivations any thing of gold worn by the perſons, will be amalgamated with the fumes of it paſſing thro' the ſkin, and will be rendered white and ſoft by it.

It diſſolves very readily in the ſtronger acid menſtrua, and what is very ſingular, in aqua fortis and aqua regia indifferently, while the other metals in general that are ſoluble in one of theſe, are not to be affected by the other. With oil of vitriol, it yields us the yellow emetic powder called turbith mineral; and with ſpirit of ſea-ſalt, corroſive ſublimate. The ſpecific gravity of pure mercury is to water as 14020 to 1000; and as it is the heavieſt of all fluids, it is alſo the coldeſt: common water is much more cold to the touch, under the ſame circumſtances, than ſpirit of wine, and conſequently, mercury than either; and when heated, mercury is in an equal degree the hotteſt of all fluids; that heat, which given to water would ſcarce be felt by the fleſh, will burn it if given to mercury.

Mercury readily mixes with gold, ſilver, lead and tin, among the metals, and with zink and biſmuth, among the ſemi-metals. See AMALGAMATION.

But notwithſtanding this, it does not eaſily blend with any other ſubſtance, except by the means of fire, or of trituration: by either of theſe methods, it may be blended intimately with ſulphur; by the former, into a red matter; by the latter, into a black powder, called æthiops mineral. See ÆTHIOPS MINERAL.

No drug ought to be ſo carefully examined as to its purity as mercury, as none is ſo frequently ſophiſticated. The weighing it hydroſtatically is the ſureſt of all means to find out this adulteration; or it may be diſcovered by evaporating a little of it, to try if any thing will remain behind: or when it is adulterated in the common way with lead, by grinding it in a mortar with vinegar. This mild acid is a menſtruum for lead, though not for mercury, and conſequently if there has been lead mixed among the mercury, it will grow ſweet to the taſte, but if the mercury be pure, it will remain unaltered.

The ores of mercury are of various kinds, but the moſt general one is known by the name of cinnabar, which very readily parts with its quickſilver, on its being diſtilled in a glaſs retort, with the addition of quick-lime or iron-filings. In many places it is ſeparated by burying certain earthen veſſels in the earth, and inverting into them others containing cinnabar, and ſtopped with a bundle of moſs; when a fire being made about theſe, the quickſilver runs through the moſs, and is ſaved in the under veſſel. The ſulphur is not ſo eaſily ſeparated from this mineral in its proper form, but if it be boiled in a ſtrong lixivium of wood-aſhes, and diſtilled vinegar be added to the clear liquor, it will be precipitated. For the properties and virtues of native and factitious cinnabar, ſee the article CINNABAR.

Mercury is not only found in cinnabar, and other ores, but is ſometimes met with in its pure and fluid ſtate, lodged in the accidental cavities of hard ſtone, for when the workmen who ſearch for its ore accidentally break into theſe cavities, it runs out like water. The unhappy creatures who work in theſe mines ſeldom live more than three or four years, and then die in a moſt miſerable manner; and the people who work it in any other manner in abundance, and for a conſtancy, are as certain of miſchief from it, being always afflicted with palſies and tremblings of the limbs. We have alſo had abundant experience from the common mercurial unguents, and from the method of taking it internally, that when proper care has not been taken, the

the nerves have frequently been terribly hurt by it, the humours colliquated, and befide the common fymptoms of a ptyalifm, ulcers of the mouth and throat, and diarrhœas of the moft dangerous kind, have been brought on.

However, under proper regulations, it is a moft powerful and noble medicine. Its virtues in opening the obftructed paffages, and in attenuating tough and vifcid humours in the very remoteft parts of the body, are fuperior to thofe of almoft any other medicine. Whence it is found of great ufe in ftoppages of the glands, in fchirrofities of the fpleen and mefentery, and in ftrumous and fcrophulous cafes. It is alfo well known to be fuperior to any thing in the itch, and other cutaneous eruptions of the moft malignant kind, and alfo in venereal ulcers.

On its being imported it pays a duty of $6\frac{97\frac{1}{2}}{100}$d. the pound, and draws back on exportation $6\frac{12}{100}$d.

Crude mercury is beft prepared for internal ufe by diftilling it in a retort; and a good method of giving it in fmall dofes, is the rubbing it with fine fugar in a mortar, with a fmall proportion of oil of almonds, till it is perfectly blended with the fugar.

Crude mercury is an ingredient in many of the ointments and plafters of the fhops, and is frequently ordered in extemporaneous prefcriptions. In this cafe the common method of giving it is in the form of pills, in which it is killed with turpentine, and mixed with other ingredients principally of the purging kind.

Preparations of MERCURY, now in ufe in the fhops, are chiefly thefe, 1. æthiops mineral: 2. factitious cinnabar: turbith mineral: 4. white precipitate: 5. corrofive mercury fublimate: 6. mercurius calcinatus, commonly called precipitate per fe: 7. red mercurial corrofive: 8. coralline mercury: and, 9. mercurius dulcis.

For the manner of preparing the four firft of thefe, fee ÆTHIOPS MINERAL, CINNABAR, *&c.*

Corrofive mercury fublimate, or white corrofive mercury, is prepared in the following manner: take of purified mercury, forty ounces; of fea-falt, thirty-three ounces; of nitre, twenty-eight ounces, and of calcined green vitriol, fixty-three ounces. Rub the quickfilver firft in an ounce or more of corrofive fublimate, in a wooden or ftone-veffel, till it be broken into fmall grains; then mix with it the nitre, afterwards the fea-falt, till the mercury quite difappears; laftly, add the calcined vitriol, but do not rub the mixture too long with it, left the quickfilver fhould begin to part again; put the whole into a matrafs with an alembic-head, and fublime it. The corrofive fublimate will be found in the head, and a fpirit in a fmall quantity will run into the receiver. This is a terrible poifon, and corrodes every part it touches as it goes down into the ftomach; it is therefore only ufed externally, for eating down proud flefh, and cleanfing old and foul ulcers. Mercurius calcinatus, or calcined mercury, commonly called precipitate per fe, is thus prepared: fet purified mercury upon a fand heat for feveral months, in a glafs-veffel with a broad bottom, and a fmall aperture to let in the air, till it be reduced to a red powder. This preparation is in great efteem in all cafes in which mercurials are proper: two or three grains are generally given for a dofe. Red mercurial corrofive, improperly called red precipitate, is thus prepared: take any quantity of purified mercury, put it into a flat-bottomed glafs, and add to it an equal quantity in weight of aqua fortis: fet the mixture in a fand-heat till all the moifture is evaporated, and the mafs at bottom has acquired a fine red colour. This is a mild efcharotic, and is ufed in eating down carnofities and proud flefh in ulcers, which it performs with very little pain. Coralline mercury, or arcanum corallinum, is thus prepared: pour upon the mercurial red corrofive thrice its weight of rectified fpirit of wine, and digeft them together two or three days in a gentle heat, often fhaking the veffel: then fet fire to the fpirit, ftirring the powder continually till the fpirit is quite burnt away. This powder is given in fmall dofes of two or three grains. For the manner of preparing mercurius dulcis, alfo called draco mitigatus, aquila alba, and calomel. See CALOMEL.

Animated MERCURY. See ANIMATED.

MERCURY, ☿, in aftronomy, the fmalleft of the planets, and the neareft the fun. See the article COPERNICAN.

Its mean diftance from the fun is 387 of fuch parts of which the earth is 1000, its excentricity is 80 of fuch parts. The inclination of its orbit is 6° 54′; i

performs its revolution round the fun in 87 days, 23 hours, 16′; its greateft elongation is about 22° 46′. The place in the ecliptic for the afcending node is in 14° 42′ of taurus. Its diameter to that of the earth is as 3 to 4: and therefore the globe of mercury will be to that of the earth as 2 to 5.

Mercury, in the fame manner as venus, always keeps himfelf in the neighbourhood of the fun, and never recedes from him fo far as venus does; he hides himfelf fo much in the fplendor of the fun's rays, that he is but feldom feen by us on the earth: but fince the invention of telefcopes, he has been frequently obferved, when in conjunction with the fun, to pafs under his difk like a black fpot. The exceeding brightnefs by which mercury outfhines all the planets, does evidently prove him to be much nearer the fun than any of the reft; for the nearer any body is to the fun, the greater illuftration it receives from him. From all this it is evident, that mercury does likewife go round the fun in a leffer orbit, included within the orbit of venus. See the article VENUS.

Again, whatever is demonftrated concerning the motions of venus, is likewife true, and to be underftood of the motions of mercury; but the conjunctions of mercury with the fun, his directions, ftations, and retrogradations, are more frequent than in venus; for mercury circulating fafter, and in a leffer orbit than venus, does oftner overtake the earth than fhe. Hence it is plain, that the motions of thefe two planets feen from the earth, are very irregular and unequal, fince they are fometimes feen to have a motion forward; fometimes they appear immoveable, or ftationary, after this they change their courfe, and move backwards, and after fuch a regreffion they again take up their ftations, and keep for fome time the fame place in the zodiac: whereas a fpectator in the fun will always obferve thefe planets to go forward with a motion regulated after a certain rate; for the apparent inequality of thefe motions, feen from the earth, is fuch as exactly anfwers to a regular motion round the fun: and therefore it is manifeft that the fun, and not the earth, is the center of thefe planets motions.

Dr. Halley, in his obfervation of mercury, feen in the fun, A. D. 1677, at St. Helena, fays, that this planet may be feen nine times in the fun, near the afcending node, A. D. 1710, 1723, 1736, 1743, 1756, 1769, 1776, 1782, 1789, in October, and four times near the other node, in the month of April, A. D. 1707, 1753, 1786, 1799; all in this century. Dr. Gregory, in his elements of aftronomy, defcribes the phænomena that will appear to the eye in mercury: he fays, that befides the phænomena of the order of the fixed ftars, which agree alike with an eye placed any where within the orbit of faturn, it is plain that the eye, pofited in mercury, will fee the fun almoft three times broader than we fee it from the earth, becaufe that planet is almoft three times nearer to the fun than the earth. Whence alfo the folar difk, feen from mercury, is feven times greater than the difk as it appears to us, and mercury has feven times more light and heat, *cæteris paribus*, than the earth. But thefe qualities are much more or lefs intenfe, according to the different diftance of mercury from the fun; for its orbit is much more excentric, than the orbit of any other planet.

The accelerating gravity, towards the fun, is alfo feven times greater there than here.

It has not yet been found by obfervation, whether mercury turns upon its own axis, and therefore it cannot be certainly defined, whether to an eye, placed on its furface, all the things without will appear to revolve with a contrary motion; that is, whether it has the viciffitude of day and night, much lefs what is the fpace of its nychthemeron, or natural day: but we may fafely enough conjecture, that it does revolve about its axis, fince other planets do. But the year of mercury is fcarce equal to a quarter of our year, tho' it is uncertain whether it has different feafons, becaufe they depend upon the inclination of the axis of its rotation, which is unknown, to the plane of the orbit which it defcribes about the fun. The eye placed in mercury, looking at the fun, will fee the fun's fpots (when it has any) fometimes in a right line croffing his difk from eaft to weft, at another time their way will appear elliptical and curved, towards one fide or the other, and all the variety of this phænomenon will happen in one year, in which the track or way of the fpots will appear twice rectilineal. But the way of the folar fpots, feen from mercury, will be always almoft ftraight; becaufe mercury never declines much

from

from the plane of the ſun's equator, and therefore not ſenſibly from the planes of the circles, which the ſpots deſcribe by their rotation. And as the plane of the orbit of the earth is moſt of all inclined to the ſaid plane of the ſun's equator, the way of the ſpots, ſeen from the earth, appears more curved than if the ſun was ſeen from any other planet. This curvature will be ſomething leſs, ſeen from jupiter or mars; and yet leſs from ſaturn, leſs ſtill from venus, and leaſt of all from mercury, as we have juſt obſerved.

The other five planets are ſuperior to mercury, therefore their phænomena are to an eye placed in mercury, as the phænomena of mars, jupiter and ſaturn, ſeen from the earth. Therefore venus and the earth, when they are in oppoſition with the ſun, will ſhine with a full orb, and reflecting the ſun's rays very directly, will ſhine upon mercury all night, and powerfully expel the darkneſs. For ſince venus, when it is horned, and ſhews the leaſt part of its enlightened hemiſphere to the inhabitants of the earth, is ſo bright as to caſt a ſhadow, it will appear very bright to mercury, to which it turns its whole enlightened hemiſphere.

Mercury ſees no inferior planet known to us, conſequently ſees no celeſtial body falcated or horned; and therefore a ſpectator there, will want the argument taken from ſuch phaſes of the planets, to eſtabliſh the true ſyſtem of the world; for the phaſes of the inferior planets have clearly ſhewn that they moved about the ſun; whence it was natural to think the ſame of the other motions. But neverthelеſs, tho' we do not ſee any planets inferior to mercury, it does by no means follow that there are no ſuch: for mercury himſelf is ſeldom ſeen in our oblique ſphere, and one that ſhould be much inferior to it would never be ſeen, upon account of its nearneſs to the ſun.

Mercury, in heraldry, a term uſed, in blazoning by planets, for the purple colour, in the arms of ſovereign princes. See the article Blazoning.

Mercury, in matters of literature, denotes a book, or other paper, chiefly filled with news; ſo called from the pagan deity Mercury, who is ſaid to have been the meſſenger of the gods. Hence alſo the perſons employed to collect news, or diſtribute the news papers, are called mercuries.

MERCY, *miſericordia*, in law. See the article Misericordia.

Mercy-seat, or Propitiatory, in jewiſh antiquity. See Propitiatory.

MERGANSER, in ornithology, a ſpecies of mergus. See the next article.

MERGUS, in ornithology, a genus of birds, of the order of the anſeres, diſtinguiſhed by having the beak of a cylindrical figure, and hooked at the extremity, and its denticulations of a ſubulated form.

To this genus belongs the merganſer, with a hanging creſt, a bluiſh-black head, and a circle of white round the neck: the male and female, however, are ſo very unlike, that they have got diſtinct engliſh names; the former being called gooſeander, and the latter the dundiver, or ſparling fowl. There are ſeveral other ſpecies, diſtinguiſhed by their different colours.

MERIDIAN, in aſtronomy, a great circle paſſing through the poles of the world, and both the zenith and nadir, croſſeth the equinoctial at right angles, and divideth the ſphere into two hemiſpheres, the eaſtern and weſtern: it has its poles in the eaſt and weſt points of the horizon. It is called meridian, becauſe when the ſun cometh to the ſouth part of this circle, it is then mid-day; and then the ſun has his greateſt altitude for that day. Theſe meridians are various, and change according to the longitudes of places; ſo that they may be ſaid to be infinite in number, for all places from eaſt to weſt have their ſeveral meridians: but there is (or ſhould be) one fixed, which is called the firſt meridian. Ptolemy choſe to make that the firſt meridian which paſſes near the Fortunate iſlands, at about the diſtance of one degree from them; and reckons from thence to the eaſt thro' Africa and Aſia; chooſing to begin at a place inhabited, and which was then the bounds and limits of the known part of the earth to the weſt, and to end at the eaſtern ſhore of Scain in Aſia; but America being diſcovered not many ages ago, and long after Ptolemy's time, the firſt meridian was removed more to the weſt. Some made that the firſt meridian which paſſes through the iſle of St. Nicholas, which is one of thoſe near Cape Verd; and Hondius choſe the iſle of St. James to be the firſt in his maps.

Others choſe that which paſſes through the iſle del Corvo, one of the Azores,

becaufe the needle was found not to decline from the north there and in the adjacent feas, but to lie in the meridian line; and this beginning Mercator choofes. But feeing there are other places where the needle points to the north, and it doth not fo in every part of that meridian, geographers thought this not a fufficient reafon; fome fixing it at the fhore of Brafil, that runs out into the fea. Later geographers choofe to begin at the mountain Teneriff, in the Fortunate or Canary iflands, which is counted one of the higheft on the earth; and the rather becaufe they thought fome remarkable place fhould be chofen that might be moft known to future ages; and fo Ptolemy's firft meridian, though long obferved, was not laid afide without good reafon. The French, fince the year 1634, have taken that which goes through the weft part of the ifle of Fero, one of the Canaries. Aftronomers alfo have taken divers places for the firft meridian; the followers of Tycho fix it at Uraniburg, an ifland in the danifh ftreights, and calculate the celeftial motions to that place, and from thence accommodate them to the reft. Others choofe other places, according to the authors of the ephemeris they ufe, who calculate the ephemeris, and the planets places for the meridian of their own place. As Riccioli, who fixed his firft meridian at Bologna; Mr. Flamfteed, at the royal obfervatory at Greenwich; and the French, at the obfervatory at Paris. See OBSERVATORY.

But without regard to any of thefe rules, our geographers and map-makers frequently affume the meridian of the place, or the capital of the country, for the firft meridian; and thence reckon the longitudes of their places.

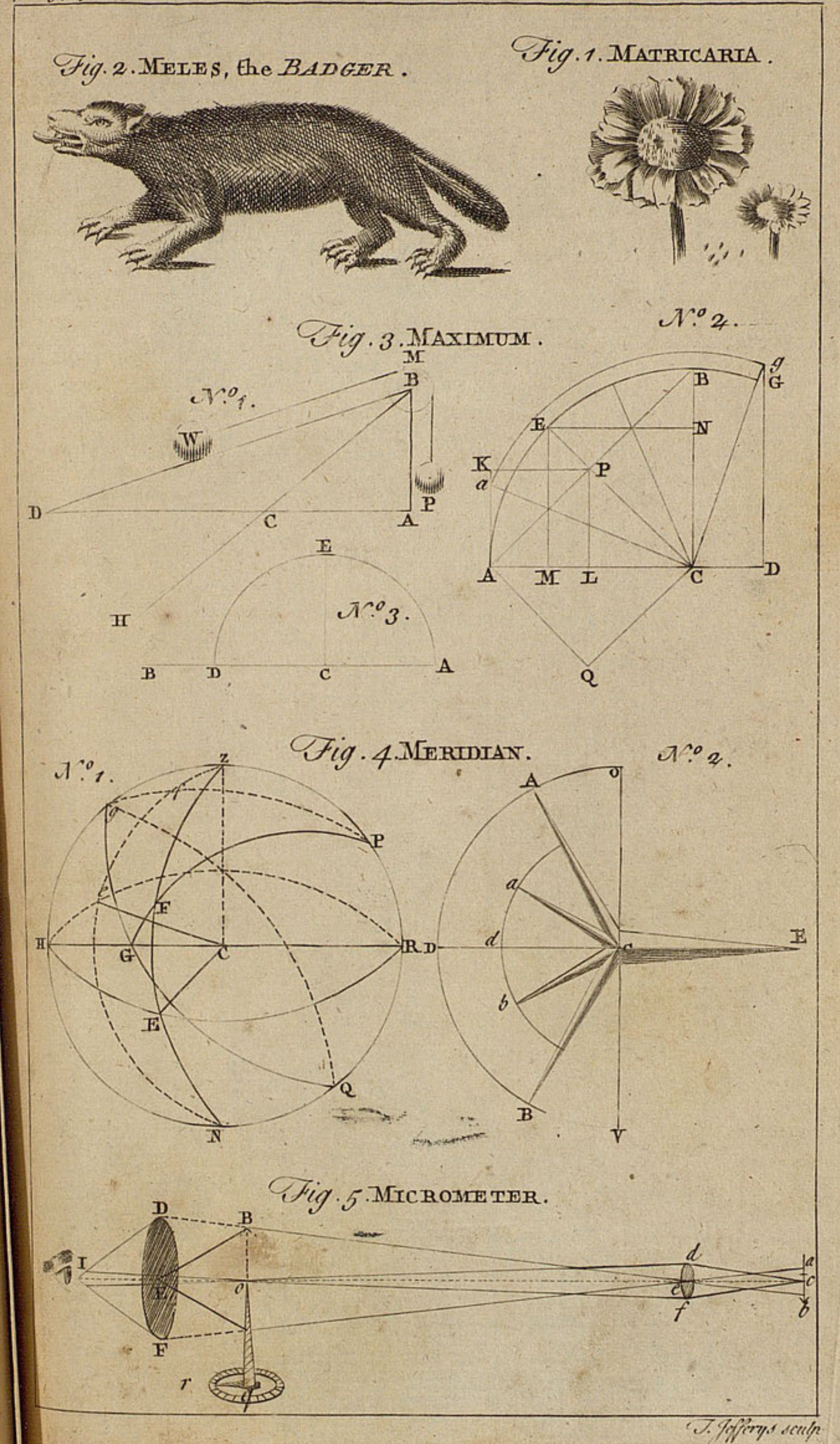
In the Philofophical Tranfactions, there is a fuggeftion that the meridians vary in time. This feems very probable, from the old meridian line in the church of St. Petronio at Bologna, which is found to vary no lefs than eight degrees from the true meridian of that place at this time; and from that of Tycho Brahe at Uranibuig, which M Picart obferves varies eighteen minutes from the modern meridian. If there be any thing of truth in this hint, Dr. Wallis fays, the change muft arife from a change of the terreftrial poles (here on earth, of the earth's diurnal motion) not of their pointing to this or that of the fixed ftars: for if the poles of the diurnal motion remain fixed to the fame place on the earth, the meridians which pafs through thefe poles muft be the fame.

But this notion of the changes of the meridian, feems overthrown by an obfervation of M. Chazelles, of the french academy of fciences, who, when in Egypt, found that the four fides of a Pyramid built 3000 years ago, ftill looked very exactly to the four cardinal points; a pofition, which could never be looked on as fortuitous.

The meridian on the globe or fphere, is reprefented by the brazen circle, in which the globe hangs and turns. It is divided into four times 90, or 360°, beginning at the equinoctial. See GLOBE. On it, each way from the equinoctial, on the celeftial globes, is counted the fouth and north declination of the fun or ftars; and on the terreftrial globe, the latitude of places north or fouth. There are two points of this circle, which are called the poles of the world; and a diameter continued from thence through the center of either globe, is called the axis of the earth or heavens, on which they are fuppofed to turn round. On the terreftrial globes there are ufually thirty-fix meridians drawn, one thro' every tenth degree of the equator, or thro' every tenth degree of longitude. The ufes of this circle are. 1. To fet the globes to any particular latitude. 2. To fhew the fun's or a ftar's declination, right afcenfion, or greateft altitude, *&c.*

To find the fun's MERIDIAN *altitude or depreffion at night, by the globes.* Bring the fun's place to the meridian above the horizon for his altitude at noon; which will fhew the degrees of it, counted from the horizon. For his midnight depreffion below the north-point of the horizon, you muft bring the oppofite point to the fun's prefent place, as before to the meridian; and the degrees there intercepted between that point and the horizon, are his midnight depreffion.

Meridian line is an arch or part of the meridian of a place, terminated each way by the horizon. Or it is the interfection of the plane of the meridian of the place with the plane of the horizon, vulgarly called a north and fouth line, becaufe its direction is from one pole towards the other. It is of great ufe in aftronomy, geography, dialling, *&c.* and on its exactnefs all depends; whence divers aftronomers have took infinite



T. Jefferys sculp.

finite pains to have it to the laſt preciſion.

To draw a MERIDIAN *line.* Knowing the ſouth quarter pretty nearly, obſerve the altitude F E (plate CLXXI. fig. 4. n° 1. of ſome ſtar on the eaſtern ſide thereof, not far from the meridian HZRN: then, keeping the quadrant firm on its axis, ſo as the plumbet may ſtill cut the ſame degree, only directing it to the weſtern ſide of the meridian, wait till the ſtar has the ſame altitude as before, *f e.* Laſtly, biſſect the angle E C *e*, formed by the interſection of the two planes wherein the quadrant is placed at the time of the two obſervations, by the right line HR. This line H R is a meridian line.

Or thus: which is a very eaſy and good method for practice. On an horizontal plane, from the center C, (*ibid*, n° 2.) deſcribe ſeveral concentric arches BA, *b a*, *&c.* and on the ſame center C, erect a ſtyle or gnomon, perpendicular to the plane ACB, a foot or half a foot long. About the time of the tropics before noon, between the hours of nine and eleven in the morning, and between one and three in the afternoon, obſerve the points B, *b*, *&c.* A, *a*, wherein the ſhadow of the ſtyle terminates. Biſſect the arches AB, *ab*, *&c.* in D, *d*, *&c.* If then the right line DE biſſect all the arches AB, *ab*, *&c.* it will be the meridian line ſought. As the extremity of the ſhadow is ſomewhat hard to determine, it will be convenient to have the ſtyle flat at the top, and to drill a little hole, noting the lucid ſpot projected by it on the arches AB and *a b*, inſtead of the extremity of the ſhadow.

Hence, if the meridian line be biſſected by a right line O V, drawn perpendicularly through the point C, O V, will be the interſection of the meridian, and firſt vertical, and conſequently O will ſhew the eaſt point, and V the weſt.

MERIDIAN LINE, on a dial, is a right line ariſing from the interſection of the meridian of the place, with the plane of the dial: this is the line of twelve o'clock, and from hence the diviſion of the hour-lines begins. See the article DIAL.

Magnetical MERIDIAN, is a great circle paſſing through the magnetical poles, to which the magnetic needle, or needle of the mariner's compaſs, conforms itſelf.

MERIDIAN *altitude of the ſun or ſtars*, is their altitude when in the meridian of the place where they are obſerved. Or it may be defined, an arch of a great circle perpendicular to the horizon, and comprehended between the horizon and the ſun or ſtar then in the meridian of the place.

To take the MERIDIAN *altitude with a quadrant.* If the poſition of the meridian be known, and the plane of an aſtronomical quadrant be placed in the meridian line, by means of the plumb-line ſuſpended at the center, the meridian altitudes of the ſtars, which are the principal obſervations whereon the whole art of aſtronomy is founded, may eaſily be determined. The meridian altitude of a ſtar may likewiſe be had by means of a pendulum-clock, if the exact time of the ſtar's paſſage by the meridian be known. Now it muſt be obſerved, that ſtars have the ſame altitude for a minute before and after their paſſage by the meridian, if they be not in or near the zenith; but if they be, their altitudes muſt be taken every minute when they are near the meridian, and their greateſt altitudes will be the meridian altitudes ſought. See QUADRANT.

MERIDIONAL DISTANCE, in navigation, is the ſame with the departure, eaſting or weſting, or the difference of longitude between the meridian under which the ſhip now is, and any other meridian ſhe was before under.

MERIDIONAL PARTS, MILES, or MINUTES, in navigation, are the parts by which the meridians in Mr. Wright's chart (commonly though falſely called Mercator's) do increaſe as the parallels of latitude decreaſe: and as the coſine of the latitude of any place, is equal to the radius or ſemi-diameter of that parallel; therefore, in the true ſea-chart, or nautical planiſphere, this radius being the radius of the equinoctial, or whole ſine of 90°, the meridional parts at each degree of latitude muſt increaſe, as the ſecants of the arch, contained between that latitude and the equinoctial, do decreaſe. The tables therefore of meridional parts, which we have in books of navigation, are made by a continual addition of ſecants; they are calculated in ſome books for every degree and minute of latitude; and they will ſerve either to make or graduate a Mercator's chart, or to work the Mercator's ſailing. To uſe them, you muſt enter the table with the degree of latitude at the head, and the minute on the firſt column towards the left hand, and in the angle of meeting you will have the meridional parts. Having the latitudes of two places, to find the meridional miles or minutes between them, conſider whether one of the places lies on the equator,

equator, or both on the same side of it, or, lastly, on different sides. 1. If one of the proposed places lies on the equator, then the meridional difference of latitude is the same with the latitude of the other place, taken from the table of meridional parts. 2. If the two proposed places be on the same side of the equator, then the meridional difference of latitude is found by subtracting the meridional parts answering to the least latitude, from those answering to the greatest, and the difference is that required. 3. If the places lie on different sides of the equator, then the meridional difference of latitude is found by adding together the meridional parts answering to each latitude, and the sum is that required.

We have here added a table of meridional parts calculated both for the sphere and oblate spheroid, by the reverend Mr. Murdoch, in his new and learned Treatise of Mercator's Sailing applied to the true Figure of the Earth. By this table may be projected a true chart, for any part of the earth's surface, and the several problems of sailing may be solved by it. Maps of countries may be delineated and applied to the various purposes of navigation, geography, and astronomy. Nor are the errors of the common spherical projections so very small in many cases, as to be inconsiderable and not dangerous. For instance, if a ship sails from south latitude 25°, to north latitude 30°, and the angle of the course be 43°; then the difference of longitude by the common table would be 3206′, exceeding the true difference 3141′ by 65′, or miles. Also the distance sailed would be 4512, exceeding the true distance, 4423, by 89′, or miles; which differences are too great to be neglected. For other instances of such a correction of the charts, we refer to the author's admirable book above-mentioned.

A Table of meridional Parts to the Spheroid and Sphere, with their Differences.

D.	Spheroid.	Sphere.	Diff.
1	58.7	60.0	1.3
2	117.3	120.0	2.7
3	176.1	180.1	4.0
4	234.9	240.2	5.3
5	293.8	300.4	6.6
6	352.7	360.6	7.9
7	411.8	421.0	9.2
8	471.0	481.5	10.5
9	530.4	542.2	11.8
10	589.9	603.0	13.1
11	649.7	664.1	14.4
12	709.6	725.3	15.7
13	769.8	786.8	17.0
14	830.2	848.5	18.3
15	890.9	910.5	19.6
16	951.8	972.7	20.9
17	1013.1	1035.3	22.2
18	1074.8	1098.3	23.5
19	1136.8	1161.6	24.8
20	1199.2	1225.2	26.0
21	1262.0	1289.2	27.2
22	1325.3	1353.7	28.4
23	1389.0	1418.6	29.6
24	1453.3	1484.1	30.8
25	1518.0	1550.0	32.0
26	1583.3	1616.5	33.2
27	1649.1	1683.5	34.4
28	1715.6	1751.2	35.6
29	1782.7	1819.5	36.8
30	1850.5	1888.4	37.9
31	1919.0	1958.0	39.0
32	1988.2	2028.3	40.1
33	2058.3	2099.5	41.2
34	2129.0	2171.4	42.3
35	2200.8	2244.2	43.4
36	2273.4	2317.9	44.5
37	2347.0	2392.6	45.6
38	2421.6	2468.3	46.7
39	2497.2	2544.9	47.7
40	2573.9	2622.6	48.7
41	2651.8	2701.5	49.7
42	2730.9	2781.6	50.7
43	2811.3	2863.0	51.7
44	2893.1	2945.8	52.7
45	2976.2	3029.9	53.7
46	3060.9	3115.5	54.6
47	3147.2	3202.7	55.5
48	3235.1	3291.5	56.4
49	3324.8	3382.1	57.3
50	3416.3	3474.5	58.2
51	3509.7	3568.8	59.1
52	[illegible]	3665.2	59.9
53	3703.1	3763.8	60.7
54	3803.1	3864.6	61.5
55	3905.7	3968.0	62.3
56	4010.9	4073.9	63.0
57	4118.9	4182.6	63.7
58	4229.8	4294.2	64.4
59	4344.0	4409.1	65.1
60	4461.5	4527.3	65.8
61	4582.7	4649.2	66.5
62	4707.8	4775.0	67.2
63	[illegible]	4904.9	67.8
64	4971.0	5039.4	68.4
65	5109.8	5178.8	69.0
66	[illegible]	5323.6	[illegible]

D.	Spheroid.	Sphere.	Diff.
67	5403.9	5474.0	70. 1
68	5560.2	5630.8	70. 6
69	5723.5	5794.6	71. 1
70	5894.4	5965.9	71. 5
71	6073.7	6145.6	71. 9
72	6262.4	6334.7	72. 3
73	6461.6	6534.3	72. 7
74	6672.6	6745.7	73. 1
75	6896.8	6970.3	73. 5
76	7136.2	7210.0	73. 8
77	7393.0	7467.1	74. 1
78	7670.1	7744.5	74. 4
79	7970.9	8045.6	74. 7
80	8300.2	8375.2	75. 0
81	8663.8	8739.0	75. 2
82	9070.0	9145.4	75. 4
83	9530.2	9605.8	75. 6
84	10061.1	10136.9	75. 8
85	10688.7	10764.6	75. 9
86	11456.5	11532.5	76. 0
87	12446.0	12522.1	76. 1
88	13840.4	13916.4	76. 0
89	16223.8	16299.5	75. 7
90			37.75

MERIONETHSHIRE, a county of north Wales, bounded by Caernarvon and Denbighshire on the north, by Montgomeryshire on the south east, and by the Irish sea on the west.

MERIT, in theology, signifies desert. This term is more particularly used to signify the moral goodness of the actions of men, and the rewards to which those actions intitle them.

The romish schoolmen distinguish merit towards God into two kinds, *viz.* merit of congruity, and merit of condignity. The first, which is improperly called merit, is when there is no manner of proportion between the action and the reward, but he who bestows it, supplies, by his goodness, what is wanting in the action. Merit of condignity is when there is a just and strict proportion between the action and the reward, as in the wages of a workman. Protestants disclaim all merit of this kind.

MERK, a river of the Austrian Netherlands, which rises in the province of Brabant, and falls into the sea, opposite to the island Overflackee in Holland.

MERLIN, *æsalon*, in ornithology, the least of the hawk kind, but much resembling the haggard-falcon.

The merlin, if well manned, makes an excellent hawk, which will naturally fly at a partridge, thrush, or lark. See the articles FALCON and HAWK.

MERLON, in fortification, is that part of a parapet which is terminated by two embrassures of a battery. Its height and thickness is the same with that of the parapet; but its breadth is generally nine feet on the inside, and six on the outside. It serves to cover those on the battery from the enemy; and is better when made of earth well beat and close, than when built with stone; because these fly about and wound those they should defend.

MERLUCIUS, in ichthyology, a fish called in english the hake. See HAKE.

MERMAID, or MERMAN, an imaginary animal, supposed to be half human and half fish; which probably took its rise from an imperfect view of the fish called thrichechus. See THRICHECHUS.

MERNS, a county of Scotland, bounded by Mar on the north, by the German ocean on the east, by Angus on the south, and by Gowry on the west.

MERO, a town of the further india, situated in the kingdom of Pegu: east long. 94°, and north lat. 17°.

MEROPS, the BEE-EATER, in ornithology, the blue-breasted ispida, with a variegated head; a very beautiful bird, somewhat larger than the common kingfisher. See the article ISPIDA.

It catches bees and other flying insects while on the wing, whence its english name: they usually fly in flocks, and make a loud but not disagreeable noise, somewhat like that of a man whistling.

MERS, a county of Scotland, bounded by Lothian on the north, by the German ocean on the east, by Northumberland and Tiviotdale on the south, and by Tweedale on the west.

MERSBURG, a city of upper Saxony, in the marquisate of Misnia, sixteen miles north-west Leipsic.

MERSPURG, a city of Germany, in the circle of Swabia and bishopric of Constance, eight miles north east of the city of Constance.

MERTOLA, a town of Portugal, in the province of Alentejo: west long. 8° 15′, and north lat. 37° 35′.

MERUE, the north branch of the river Maes, on which the city of Rotterdam is situated.

MERVILLE, a town of french Flanders, near the confines of Artois: east longit. 2° 36′, and north lat. 50° 40′.

MERULA, the BLACKBIRD, in ornithology,

logy, a species of the turdus or thrush-kind. See the article TURDUS.

It is about the size of the common thrush, all over black, except the beak and eye-lids, which are yellowish.

There is also another species, called merula saxatilis, of a grey colour, with pinnated plumes: it is about the size of the former.

MESCHED, or THUS, a city of Persia, in the province of Chorassan: east. lon. 57° 30′, and north lat. 36°.

MESEEN, the capital of a province of the same name, in Russia: it is a port town, situated on the coast of the White-sea, one hundred and fifty miles north-east of Archangel.

MESEMBRYANTHEMUM, in botany, a genus of the polyandria-pentagynia class of plants, the corolla whereof consists of a single petal, with a multitude of petals of a lanceolated, narrow figure, formed into several series a little longer than the cup, and cohering at the base by their ungues; the fruit is a fleshy, roundish capsule, with a radiated umbilicus, and with a number of cells equal to that of the styles; the seeds are numerous and roundish. The number of styles is sometimes ten, and sometimes they, and the segments of the calyx, are only four.

This genus comprehends the ice-plant, and the flowering-kali.

MESENTERIC FEVER, called by Heister the stomachic or intestinal fever, and by Sydenham the new fever, is, by the generality of those who have wrote about it, referred to the malignant kind from its being usually attended with severe and uncommon symptoms. It differs from other acute fevers, according to Heister, in being always attended with a diarrhœa, which however is salutary, and is dangerous to stop. This fever has its seat in the stomach and intestines. Many of the distempers mentioned by authors under peculiar names, are properly to be referred, as to their causes, to this species of fever: the dysenteric is absolutely of this kind, and many of the petechial ones. The patient is seized with this distemper, which returns at different and irregular intervals, with frequent shiverings; after these, the tongue, teeth, and fauces are covered with a foul and viscid phlegm; the tongue in particular, after looking yellowish and blackish with it: the patient perceives a disagreeable taste in his mouth from this, and the people about him an ill smell: the hypochondria are always distended, and often in pain: the urine becomes turbid, and deposites a muddy sediment, during the whole course of the distemper. In the cure, all hot medicines must be avoided, and the discharge of the peccant matter by the diarrhœa must be promoted by clysters and by purging medicines: some advise aloes and other medicines of that kind; others sena and manna; some the purging salts; but most prefer rhubarb given in often repeated small doses: large draughts of the lubricating decoctions, such as barley-water and water-gruel, are to be given, and emulsions of sweet-almonds and of the cold seeds: small quantities of oil of sweet-almonds are also to be given at times, and juleps of the cooling waters, and syrups moderately acidulated; and powders of nitre, cinnabar, and the common absorbents, as crab's eyes, and the like, are to be given, to take off the pains, and spasms, and to attemperate the acid matter. The diet is not to be so very thin and weak as in other acute fevers, but moderate nourishment is to be allowed.

• MESENTERY, in anatomy, a thick fat membrane, placed in the midst of the intestines particularly of the smaller ones, whence it has the name. Its substance is composed of membranes, fat, vessels of all kinds, and in the human body of a number of glands. In the upper part, it is connected with the three superior vertebræ of the loins; and in the lower, with the intestines, and particularly with the jejunum and ileum; to which it also gives their outer coat. When it is separated from the intestines, it has several folds resembling gloves. Its length, in the whole, is about three ells; but the intestines which are joined to it, are at least four times that length. Its coats or membranes are two, and between these there is a cellular substance, which contains the fat: the meseraic vessels and glands are also placed there, which many reckon a third coat of the mesentery, and that not improperly; this they call the tunica cellulosa.

The vessels of the mesentery are blood-vessels, nerves, lacteals, and lymphatics. The blood-vessels are the same with those of the intestines, and these make a multitude of strange meanders, and have very frequent anastomoses. The nerves also come from the par vagum, and the intercostals.

costals. There are a multitude of glands dispersed throughout the whole mesentery: these vary greatly in their size, figure, and situation in different subjects, and in old people they frequently almost disappear. In comparative anatomy we find, that in dogs there is only one, but that very large, called pancreas Asellii: the lacteal vessels pass thro' these glands. The uses of the mesentery are, 1. To suspend, connect together, and retain in their due place all the intestines. 2. To sustain the sanguiferous and lacteal vessels of the intestines. And, 3. To make the way for the lacteals, to the receptacle, the shorter.

MESNE, in law, signifies him who is lord of a manor, and who hath tenants holding of him, yet himself holding of a superior lord. This word also signifies a writ, which lies where there is a lord-mesne and tenant, and the tenant is distrained for services due from the mesne to the superior lord.

MESOCOLON, in anatomy, that part of the mesentery connected with the great guts, especially the colon. See the article MESENTERY.

The mesocolon meets the midst of the colon, to which it is joined. Its lower part sticks to a part of the rectum.

MESOLABE, an instrument used by the antients for finding two mean proportionals mechanically, which they could not effect geometrically.

It consisted of three parallelograms, moving in a groove to certain intersections.

MESOLOGARITHMS, according to Kepler, are the logarithms of the co-sines and co tangents, the former of which were called by lord Napier antilogarithms, and the latter differentials.

They are otherwise called artificial sines and tangents. See LOGARITHM, SINE, TANGENT, &c.

MESOPLEURII, in anatomy, the intercostal muscles. See INTERCOSTAL.

MESOPOTAMIA, the antient name of Diarbeck. See the article DIARBECK.

MESOPTERYGIUS, in ichthyology, a term applied to such fishes as have only one back fin, and that situated in the middle of the back. See the article ICHTHYOLOGY.

MESPILUS, the MEDLAR, in botany, a genus of the icosandria pentagynia class of plants, the flower of which is made up of roundish hollow petals; and its fruit is an umbilicated globose berry, containing five osseous and gibbous seeds. The fruit of the medlar is very grateful, though not eatable till rotten.

MESSASIPPI, or MESCHASIPPI, a country of North America, bounded by Canada on the north, the british plantations on the east, the gulph of Mexico on the south, and the province of New Mexico on the west. See LOUISIANA.

MESSASIPPI, the river which gives name to the country, rises in Canada, and runs to the southward till it falls into the gulph of Mexico.

MESSENGERS, are certain officers chiefly employed under the direction of the secretaries of state, and always in readiness to be sent with all kinds of dispatches foreign and domestic. They also, by virtue of the secretaries warrants, take up persons for high treason, or other offences against the state. The prisoners they apprehend are usually kept at their own houses, for each of which they are allowed 6 s. 8 d. per day, by the government: and when they are sent abroad, they have a stated allowance for their journey, *viz.* 30 l. for going to Paris, Edinburgh, or Dublin; 25 l. for going to Holland, and to other places in the same proportion; part of which money is advanced, for the expence of their journey. Their standing salary is 45 l. *per annum*; and their posts, if purchased, are esteemed worth 300 l. The messengers wait twenty at a time, monthly, and are distributed as follows, *viz.* four at court, five at one secretaries office, five at another, two at the third for North Britain, three at the council-office, and one at the lord chamberlain's of the houshold.

MESSENGERS *of the exchequer*, are four officers who attend the exchequer, in the nature of pursuivants, and carry the lord treasurer's letters, precepts, &c.

MESSENGER *of the press*, a person, who, by order of the court, searches printing-houses, booksellers-shops, &c. in order to discover the printers or publishers of seditious books, pamphlets, &c.

MESSENGER *at arms*, in the scottish polity, officers whose business it is to execute summons and letters of diligence for civil debt, real or personal; thus called from the impress of the king's arms on their blazon, being a piece of brass or silver fixed upon the messenger's breast, to discover his warrant and authority, when he discharges the duty of his office; and the resisting him therein, is a crime, in the law of Scotland, called deforcement. See the article DEFORCEMENT.

The meſſengers at arms, of whom there are a great number, are among the officers under the lyon, who, together with his brethren the heralds, is the judge of the malverſation of meſſengers. See College *of Heralds*, King *at Arms*, &c.

MESSIAH, the anointed; a title which the Jews gave to their expected great deliverer, whoſe coming they ſtill wait for: and a name the Chriſtians apply to Jeſus Chriſt, in whom the prophecies relating to the Meſſiah were accompliſhed. Among the Jews, anointing was the ceremony of conſecrating perſons to the higheſt offices and dignities; kings, prieſts, and ſometimes prophets were anointed: thus Aaron and his ſon received the ſacerdotal, Eliſha the prophetic, and David, Solomon, and others, the royal unction.

The prophecies in the Old Teſtament, which relate to the coming of the meſſiah are very numerous, ſome of which may be found in Gen. iii. 15. xlix. 10. Iſaiah vii. 14. Dan. ix. 25, &c.

The antient Hebrews being inſtructed by the prophets, had very clear notions of the meſſiah: theſe were changed by little and little, inſomuch that when Jeſus Chriſt appeared in Judea, they were in expectation of a temporal monarch, who ſhould free them from their ſubjection to the Romans. Hence they were greatly offended at the outward appearance, the humility, and ſeeming weakneſs of our Saviour; which prevented their acknowledging him to be the Chriſt they expected. The latter Jews have fallen into ſtill greater miſtakes, and formed to themſelves chimerical notions of the Meſſiah, utterly unknown to their forefathers. Some think he is already come, in the perſon of king Hezekiah: this opinion was firſt advanced by the famous Hillel, who lived before Chriſt. Others think the belief of the coming of the meſſiah, is no article of faith; and that he who denies this doctrine, makes but a ſmall breach in the law; he only lops off a branch from the tree, without hurting the root. But the greateſt part of the modern rabbins, according to Buxtorf, believe that the meſſiah is already come, but that he keeps himſelf concealed, and will not manifeſt himſelf becauſe of the ſins of the Jews. Some aſſign him the terreſtrial paradiſe for the place of his abode: others, the city of Rome, where, they ſay, he keeps himſelf concealed among the leprous and infirm, at the gate of the city, expecting Elias to come and manifeſt him to men. But the moſt general opinion of the Jews is, that the meſſiah is not yet come; and theſe are ſtrangely divided about the time and other circumſtances of his coming: different times have been fixed for his appearance, many of which are elapſed, and conſequently their hopes have been baffled; inſomuch that they have pronounced an anathema againſt all thoſe who ſhall pretend to calculate his coming. In order to reconcile thoſe prophecies which ſeem to oppoſe each other, ſome of the Jews have had recourſe to an hypotheſis of two meſſiahs, who are to ſucceed each other: one in a ſtate of humiliation, poverty, and ſuffering; the other, of glory, ſplendor, and power. This firſt is to proceed from the tribe of Joſeph, and the family of Euphraim; his father is to be called Huziel, and himſelf Nehemiah: the ſecond is to be born of the race of David, to rebuild the temple of Jeruſalem, and reign over the whole world. Our Saviour foretold that falſe Chriſts ſhould ariſe, who ſhould perform ſigns and wonders, by which even the elect ſhould be in danger of being deceived. The event has verified this prediction, and there has been a conſiderable number of theſe, from Barchochebas, who aroſe in the reign of the emperor Adrian, to Zabatai Tzevi, who appeared about the year 1666.

MESUA, in botany, a genus of the polyandria-monogynia claſs of plants, the corolla whereof conſiſts of four large, hollow, rounded petals; the fruit is a coriaceous capſule, of a roundiſh, acuminated figure, formed of four valves, and marked with as many elate ſutures running longitudinally; the ſeeds are four, large and fleſhy, of a turbinated, triquetrous and obtuſe form.

METACARPUS, in anatomy, that part of the hand between the wriſt and the fingers. See Hand and Wrist.

The metacarpus conſiſts of four bones, which anſwer to the four fingers, whereof that which ſuſtains the fore-finger is the biggeſt and longeſt. They are all round and long, a little convex towards the back of the hand, and concave and plain towards the palm. They are hollow in the middle, and full of marrow; they touch one another only at their extremities, having ſpaces in the middle, in which lie the muſculi intereoſſei. See the article Interosseus.

In their upper end there is a ſinus, which receives

receives the bones of the wrist; their lower extremity is round, and is received into the sinus of the first bones of the fingers. See the article FINGER.

The inner part of the metacarpus is called the palm, and the other the back of the hand. See the article PALM.

For fractures and luxations of the metacarpus, see the articles HAND, WRIST, FRACTURE, and LUXATION.

METACARPUS, signifies, also, a small, very fleshy muscle, situated obliquely between the large internal annular or transverse ligament of the carpus, and the whole inside of the fourth metacarpal bone.

It is fixed by a small, short tendon to the os orbiculare, and to the neighbouring part of the large ligament of the carpus. From thence its fibres run more or less obliquely, towards the inside of the fourth metacarpal bone; the fibres of this muscle are of unequal lengths, and extend all the way to the articulation of the first phalanx of the little finger with the fourth metacarpal bone, but have no manner of relation to that finger. This muscle serves to turn the fourth bone of the metacarpus towards the thumb, and at the same time to increase the convexity of the back of the hand, which is called making Diogenes's cup. The fourth bone, thus moved, carries the third along with it, by reason of their connexion, which still augments the hollow on one side, and the convexity on the other.

METAGITNION, μεταγειτνιών, in chronology, the second month of the Athenian year, containing twenty-nine days, and answering to the latter part of our July, and beginning of August.

METALS, *metalla*, in natural history, are defined to be fossile bodies, fusible by fire, concreting again in the cold, and malleable, or distensible and ductile under the hammer. These are the distinguishing characters of those bodies in their pure state: but many of them are not found in this pure state in the earth, being reduced by admixtures of sulphur and other bodies to the state of ore. See ORE.

The class of the metals, according to these characters, include six bodies, *viz.* gold, silver, copper, tin, iron, and lead. For the properties, preparations, uses, and peculiar characters, *&c.* of each, see the articles GOLD, SILVER, *&c.*

The weight of the metals is one of their great distinguishing characters, from all other substances; and it serves also, by means of the hydrostatical balance, by which their specific gravities are accurately determined, to distinguish them even in mixture from one another, in a manner that no other means could ever come up to: the specific gravity of each metal may be seen in the table of specific gravities, under the article GRAVITY.

The chemists have divided the metals into two classes, the perfect and the imperfect. Gold and silver only are allowed to be of the first class, as losing nothing of their weight, nor receiving any alteration in the fire; the other four, as they want this quality of resisting the force of the heat, they call imperfect: but this is thought to be a distinction not very obvious, nor essential. The learned Boerhaave, from his History of Metals, draws the following corollaries: 1. That metals differ absolutely from all other natural or artificial bodies hitherto discovered, since the lightest metal is more than double the weight of the heaviest non-metalline body. 2. They therefore are greatly mistaken, who expect, by any conversion of substance, to take metals out of bodies non metalline; since condensation is the most difficult of all operations; and weight being the index of corporeal quantity, requires something like a creative power to increase it. 3. True metals do not discover the affinity of their matter by any thing more evidently than by their resemblance in point of weight. 4. Nothing therefore resembles gold more nearly than quicksilver, with regard to the matter in both. 5. The other properties of metals, as fixity, colour, malleability, and simplicity, may probably be produced and changed with more ease than their weight. 6. Gold therefore consists of a most pure simple matter, like mercury, fixed by another pure, simple, subtile principle, diffused through its minutest parts, and intimately uniting them to one another, and to itself. This the chemists mean, when they say it consists of mercury and sulphur. 7. The other metals consist of the same principles, but together therewith have another light matter intermixed, which is different in the different metals, and is called earth; consequently these are composed of three matters, to which in some may be added crude sulphur. 8. The different metals are resolvable, therefore, into different elements, both in respect of nature and number. 9. This resolution may be effected by means of mercury, regenerat-

ing falts, or fire, but differently, according to the different metals. 10. It is a miftake, therefore, to fay that metals may be eafily converted into one another, excepting with regard to the mercurial parts, and by firft utterly deftroying their form; and confequently the quantity of gold procured from any other metal by tranfmutation, can only be in proportion to the quantity of mercury it before contained. 11. Nor does it appear that any befides the fix above-mentioned metals can be procured by art, how confidently foever Van Helmont may have afferted this of mercury fixed by the alkaheft. 12. All the fix metals, when fufed by fire in clean veffels, have the fame appearance and perfectly refemble mercury, both in refpect of colour, denfity, the fphericity of their drops, the attraction of their parts, their mobility and manner of running: hence, therefore, it feems to follow, that mercury is a metal fufed by the fmalleft fire; that tin requires a greater degree of fire, and that if the atmofphere were hot enough to fufe it, it would be mercury, but mercury which fmokes and cafts up a froth: that lead would alfo be mercury with the next degree of heat, but mercury with certain peculiar properties of frothing and penetrating veffels: fo filver and gold are mercury, which require a much greater degree of fire, and remain immutable therein: copper again is mercury, which melts in a much intenfer heat, but is changed withal: laftly, iron becomes mercury in a degree of heat beyond any, though changeable thereby.

For the chemical character of metals, affaying metals, coppelling of metals, folution of metals by menftruums, &c. fee the articles CHARACTER, METALLURGY, ASSAYING, COPPELLING, MENSTRUUM, &c.

For the generation of metals by earthquakes. See the article EARTHQUAKE.

Prince's METAL, called alfo *Bath*-METAL, a kind of factitious metal, of a beautiful yellow, and difpofed to receive a fine polifh luftre, &c. It is prepared, according to Dr. Shaw, as follows: take fix ounces of copper, melting it in a wind-furnace; add to it one ounce of zink; then ftirring the whole well together, pour out the metal immediately. The copper and zink may be put into the crucible together, if firft covered over with the black flux, which prevents the evolution of the zink, or preferves its metalline form. See the article FLUX.

Bell-METAL. See the article BELL.

Homberg's METAL, an imitation of gold. See the article GOLD.

Semi-METALS, metallic foffils, fufible by fire, and not malleable in their pureft ftate.

Thefe are all, in their native ftate, penetrated by, and intimately mixed with fulphur, and other adventitious matter, and reduced to what are called ores.

Of this feries of foffils there are only five bodies, all naturally comprehended in the fame clafs, but each making a feparate and diftinct genus: thefe are antimony, bifmuth, cobalt, zink, and quickfilver. For the characters, preparations, and ufes of each, fee ANTIMONY, BISMUTH, COBALT, ZINK, and MERCURY.

METAL, in heraldry. There are two metals ufed in heraldry, by way of colours, *viz.* gold and filver; in blazon called *or* and *argent.*

In the common painting of arms thefe metals are reprefented by white and yellow, which are the natural colours of thofe metals. In engraving, gold is expreffed by dotting the coat, &c. all over; and filver, by leaving it quite blank.

It is a general rule in heraldry never to place metal upon metal, nor colour upon colour; fo that if the field be of one of the metals, the bearing muft be of fome colour; and if the field be of any colour, the bearing muft be of one of the metals.

METALLIC, or METALLINE, an adjective applied to fomething that bears a relation to metals. See METAL.

METALLURGY, *metallurgia*, according to Boerhaave, comprehends the whole art of preparing and working metals, from the glebe, or ore, to the utenfil; in which fenfe, affaying, fmelting, refining, fmithery, gilding, &c. are only branches of metallurgy.

Dr. Shaw however reftrains metallurgy to thofe operations required to feparate metals from their ores, for the ufes of life. Thefe operations are of two kinds, or fmaller and large; with regard to which the whole art of metallurgy may be divided into two parts, affaying and fmelting. See ASSAYING, &c.

Dr. Cramer obferves, that the art of affaying confifts in a well-made feparation of minerals, efpecially metals, and in a divifion of the feveral conftituent parts of them

them from each other, in order that the quantity and quality of each in particular may be known: it is plain that thoſe operations which belong to the general claſs of ſolution, appertain ſtrictly and primarily to this; and that the others which are performed by the aſſayer, are only ſecondary or auxiliary operations. But there is hardly any chemical operation which is not ſometimes neceſſary to be performed in the art of aſſaying: there are many, on the contrary, which are peculiar to aſſaying alone; therefore we ſhall here give a general view of thoſe which properly belong to it; or of thoſe which, though taken from chemiſtry at large, are nevertheleſs uſed by aſſayers; only firſt obſerving that every primary docimaſtical operation may, on account of its effects, be called ſolution, ſince, in every operation, the menſtrua, among which, I think, the air and fire have a right to be claſſed, effect a ſolution, by interpoſing themſelves between the parts of the objects to be changed. See the articles MENSTRUUM and FLUX.

Now a docimaſtical ſolution is either

- Dry
  - Fuſion. Vitrification. Scorification. Coppelling. Reduction. Amalgamation. Sublimation. Cæmentation. — Theſe may be called almoſt univerſal, becauſe they diſſolve either the whole maſs, or, at leaſt, by much the greater part of the ſubject in hand.
  - Roaſting. Calcination. Eliquation by fuſion. — We may call theſe partial, as they all diſſolve but one part of the ſubject in hand.
- or Moiſt
  - Elutriation. Edulcoration. Quartation. Moiſt precipitation. — All theſe are partial, and ſeparate ſome parts from the others.

An account of each of theſe may be found under their proper heads.

Dr. Shaw, after mentioning the manner of extracting metal from the ore, by aſſaying and ſmelting, gives ſeveral axioms and canons of metallurgy, among which are the following: that the art of aſſaying is hitherto imperfect, but capable of receiving conſiderable improvement from chemical and mechanical knowledge: that the troubleſome and expenſive method of ſeparating gold from ſilver by quartation, may be advantageouſly ſuperſeded, or ſet aſide, by means of fuſion, or a dexterous management of the fire: that gold and ſilver are ſeldom rendered abſolutely pure, or ſeparated from all other kinds of metallic or mineral matters; and that to purify them in this manner requires the uſe of better methods than thoſe commonly uſed for that purpoſe; though the thing itſelf is ſtill performable by art and a ſuitable proceſs: that ſulphur has different effects upon different metals; which effects being well noted, rules of practice might thence be derived, for the farther improvement of metallurgy: that the ignobler metals are ſeparable from each other by the application of proper degrees of heat, ſo as to make the more fuſible melt away from the leſs fuſible, at leaſt with the aſſiſtance of lead: that all metals are reducible by burning or calcination, to terreſtrial powders, which, by being melted with any inflammable matter, aſſume their metalline form: that the great enemies to ductility, or the true metallic nature, are ſulphur, cobalt, and things compounded thereof; but that all unctuous or inflammable bodies are friendly to metals, and promote or reſtore their ductility, when melted therewith: that copper may be made to approach to the colour of gold, and at the ſame time not loſe, but increaſe its ductility, by being amalgamated with, and diſtilled from quickſilver; and that probably many artificial or compound metals are diſcoverable by mixing various metalline and mineral bodies together, ſo as greatly to enrich and improve the art of metallurgy: that, in general, ores are no more than a natural looſe mixture of metallic matter with earthy and ſulphureous ones; whence artificial ores may be readily made by calcining a metal with ſulphur, and mixing it with earth, ſo as with heat to form ſolid lumps of ore, reſembling thoſe

thofe dug out of the mines: and that numerous experiments remain to be made, and facts of nature or obfervations to be regiftered, or the relations of bodies to be found, before this ufeful fubject of metallurgy can be brought to perfection.

METAMORPHOSIS, in general, denotes the changing of fomething into a different form; in which fenfe it includes the transformation of infects, as well as the mythological changes related by the antient poets.

Mythological metamorphofes were held to be of two kinds, apparent and real: thus that of Jupiter into a bull, was only apparent; whereas that of Lycaon into a wolf, was fuppofed to be real.

Moft of the antient metamorphofes include fome allegorical meaning, relating either to phyfics or morality: fome authors are even of opinion that a great part of the antient philofophy is couched under them; and lord Bacon and Dr. Hook have attempted to unriddle feveral of them.

Ovid's Metamorphofes make an excellent fyftem of morality: the ftories of Deucalion and Pyrrha, of Phaeton, of Baucis and Philemon, of Minos and Scylla, *&c.* being excellent leffons in this way.

METAPHOR, in rhetoric, a trope, by which we put a ftrange word for a proper word, by reafon of its refemblance to it; or it may be defined, a fimile or comparifon intended to enforce and illuftrate the thing we fpeak of, without the figns or forms of comparifon. Thus, if we fay, *God is* a fhield *to good men*, it is a metaphor, becaufe the fign of comparifon is not expreffed, though the refemblance which is the foundation of the trope, is plain; for as a fhield guards him that bears it, againft the attacks of an enemy, fo the providence and favour of God protects good men from malice and misfortunes: but if the fentence be put thus, *God is* as a fhield *to good men*, then it becomes a fimile or comparifon.

A metaphor may be formed from any thing that is the object of any of our fenfes; but that is generally the moft agreeable and fprightly, which arifes from the fenfe of feeing; becaufe of all the fenfes, feeing is the moft perfect and comprehenfive, the moft unwearied and inquifitive, the moft defirable and delightful.

If an author is obliged to give a large account of things, plain and in the road of common obfervation, he fhould raife and enoble them by ftrong and graceful metaphors. This rule Tully has obferved in his defcription of the feveral parts of this habitable globe, in his book on the Nature of the Gods. So has Virgil, in his Georgics, where he has made his meaneft and coarfeft fubjects fine and admirable, by his judicious ufe of metaphors; in his perfect lines, the little affairs of fhepherds and farmers appear with dignity; his defcriptions make the country a paradife, and his touches, as a noble writer expreffes it, turns every thing into gold. Thofe are admirable and beautiful metaphors, in which the properties of rational creatures are applied to animals, and thofe of animals to plants and trees: this way of treating a fubject gives life and beauty to the whole creation. But we receive the ftrongeft pleafure from thofe bold and comprehenfive metaphors in which, befides the illuftration of the fubject they are intended to raife and improve, convey to us a frefh and lively image.

Mr. Du Bofs juftly obferves, that metaphors, and all the other figures of rhetoric, ought to be adapted to the circumftances and fituation of thofe for whofe ufe they are defigned, and that we lofe much of the beauty of thofe metaphors which allude to the refrefhing fhade afforded from the beams of a fcorching fun; and adds, that had Virgil wrote for the cold northern nations, inftead of drawing his metaphors from a brook whofe cool ftreams quench the traveller's thirft, or from a grove fpreading a delightful fhade on the brink of a fountain, he would have taken them from a good warm ftove; from the pleafure a man who is almoft ftiff with cold, feels upon approaching the fire, or from the flower, but more agreeable, fenfation he finds on putting on a coat lined with good comfortable fur.

METAPHRASE, ufually fignifies fomething more than either a tranflation or a paraphrafe: according to Baillet, a metaphraft implies a tranflator, gloffator, and interpolator altogether.

METAPHYSICS, *metaphyfica tranfnaturalis*, ontology, or ontofophy, a fcience that treats of being, as fuch, in the abftract.

All other fciences have a neceffary dependence on this, for it fupplies them with a foundation and a method to proceed upon, without which, our knowledge of any fubject muft be very confufed and imperfect.

fect. This was probably the reason that made Aristotle style this science the true beginning of philosophy, and the most noble of all the sciences. As it is wholly conversant in the acts of the understanding it raises itself above the verge of sense and matter, by its abstracted views. The quantity of bodies it refers to the consideration of geometry, and their sensible qualities to natural philosophy, applying itself only to beings separated from their individual singularity, such as substances, accidents, relations, and whatever else may be conceived abstractedly from matter; but particularly beings purely spiritual, such as God, angels, and the soul of man: hence Aristotle terms it natural theology. The end of this science is the search of pure and abstracted truth. It casts a light upon all the objects of thought and meditation, by ranging every being with all the absolute and relative perfections and properties, modes and attendants of it, in proper ranks or classes; and thereby it discovers the various relations of things to each other, and what are their general or special differences from each other; wherein a great part of human knowledge consists: and by this means, it greatly conduces to instruct us in method, or the disposition of putting every thing in its proper rank and class of being, attributes or actions; and hence its proper affinity with logic. See METHOD.

This science, however it may seem to have been laboured, is yet capable of being farther improved: but it has many obstacles in its way. If we are short-sighted in physical matters, which are nearer our sense, and in a manner within our view, how much more must we be bewildered in our search after spiritual abstracted truths, in the consideration of universals, and of things of a transcendant nature, such as fall properly under the consideration of metaphysics. This science proceeds in unfrequented and almost unknown paths, containing very few doctrines of allowed and established certainty; few principles in which men are universally agreed; scarce any just definition, any exact and complete division; and consequently affords large matter for doubts and disputes. For, though metaphysical truths may be certain enough in their own nature, yet they are not usually so to us; but being abstruse things, and lying deep and remote from sense, it is not every one that is capable of understanding them, and there are fewer yet who understand their true use. Aristotle seems to have been the first founder and inventor of this abstracted method of reasoning, and the consideration of immaterial beings: for his predecessors in philosophy, scarce delivered any thing that was good and solid upon these subjects; and, indeed, antiquity affords nothing upon it composed with so much strength of reason as Cicero's book of the Nature of the Gods. We have but few modern works of this kind, the chief of which are Descartes, Mallebranch, Dr. Willis, Locke, Hutchinson, S' Gravesande, Dr. Moor, &c.

METAPLASMUS, in grammar, a transmutation or change made in a word, by adding, retrenching, or altering a letter or syllable thereof.

The several species of this figure are ten in number, *viz.* prosthesis, epenthesis, paragoge, diæresis, aphæresis, syncope, apocope, crasis, metathesis and antithesis; four of which augment the letters or syllables of a word, four retrench them, and two alter them. See the articles, PROSTHESIS, EPENTHESIS, &c.

METASTASIS, in medicine, a transposition or settlement of some humour or disease, on some other part; and sometimes it signifies such an alteration of a disease, as is succeeded by a solution.

METATARSUS, in anatomy, a fleshy mass lying under the sole of the foot. See the article FOOT.

It is fixed by one end in the fore part of the great tuberosity of the os calcis, and running forward from thence, it terminates in a kind of short tendon, which is fixed in the tuberosity and posterior part of the lower side of the fifth bone of the metatarsus.

Metatarsus is also the assemblage of small bones articulated to the tarsus at one end, and to the toes at the other.

METATHESIS, in grammar, a species of the metaplasmus; being a figure whereby the letters or syllables of a word are transposed, or shifted out of their usual situation, as pistris for pristis, lybia for libya, &c. See METAPLASMUS.

This word is, by physicians, used with respect to morbific causes; which, when they cannot be evacuated, are removed to places where they are less injurious.

METEMPSYCHOSIS, the doctrine of transmigration, which supposes that human souls, upon their leaving the body, become the souls of such kind of brutes as they most resemble in their manners.

This was the doctrine of Pythagoras and

his followers, who held that the fouls of vicious men were imprifoned in the bodies of miferable beafts, there to do pennance for feveral ages, at the expiration whereof they returned again to animate men; but if they had lived virtuoufly, fome happier brute, or even a human creature, was to be their lot. What led Pythagoras into this opinion was the perfuafion he had that the foul was not of a perifhable nature; whence he concluded, that it muft move into fome other body upon its abandoning this. Lucan thinks this doctrine was contrived to mitigate the apprehenfion of death, by perfuading men that they only changed their lodgings, and ceafed to live only to begin a new life. Reuchlin denies this doctrine, and maintains, that the metempfychofis of Pythagoras implied nothing more than a fimilitude of manners and defires formerly exifting in fome perfon deceafed, and now reviving in another alive. Pythagoras is faid to have borrowed the notion of a metempfychofis from the Egyptians; others fay from the antient brachmans. It is ftill retained among the antient banians, and other idolaters of India and China, and makes the principal foundation of their religion. Many of the modern Jews are faid to efpoufe this doctrine, and to fupport their opinion quote thefe words of Job, "Lo all thefe things "worketh God oftentimes with man "(in hebrew, *and thrice)* to bring back "his foul from the pit to be enlightened "with the light of the living." It is certain, that at the time of Jefus Chrift this opinion was very common among the Jews: this appears in the Gofpel, when they fay that fome thought Jefus Chrift to be John the Baptift, others Elias, others Jeremiah, *&c.*

METEMTOSIS, a term in chronology, expreffing the folar equation, neceffary to prevent the new moon from happening a day too late, by which it is oppofed to proemptofis, which fignifies the lunar equation neceffary to prevent the new moon from happening a day too foon. The new moon's running a little backward, that is, coming a day too foon, at the end of three hundred twelve years and a half; by the proemptofis a day is added every three hundred years, and another every two thoufand four hundred years. On the other hand, by the metemptofis, a biffextile is fuppreffed every one hundred and thirty-four years; that is, three times in four hundred years. These alterations are never made but at the end of each century; that period being very remarkable, and rendering the practice of the calendar eafy.

There are three rules for making this addition or fuppreffion of the biffextile day, and by confequence for changing the index of the epacts. 1. When there is a metemptofis without a proemptofis, the next following, or lower index, muft be taken. 2. When there is a proemptofis without a metemptofis, the next preceding, or fuperior index is to be taken. 3. When there are both a metemptofis and proemptofis, or when there is neither the one nor the other, the fame index is preferved.

METEOR, in phyfiology, an imperfect, changeable, and mixt body, or the refemblance of a body appearing in the atmofphere, and formed by the action of the heavenly bodies, out of the common elements.

Meteors are of three kinds, fiery, airy and watery. Fiery meteors confift of a fat fulphureous fmoke fet on fire; fuch as lightning, thunder, falling ftars, draco volans, the ignis fatuus, and other phænomena, appearing in the air. Airy meteors confift of flatulent and fpirituous exhalations, fuch as winds, *&c.* Watery meteors are compofed of vapours, or watery particles, varioufly modified by heat and cold, fuch as clouds, rain, hail, fnow and dew. See the articles LIGHTENING, WIND, HAIL, *&c.*

Dr. Woodward fuppofes that the matter of which many of the meteors are formed, is in a great meafure of a mineral nature; and that the mineral particles contained in the ftrata of the earth, are raifed by the fubterraneous heat, together with the vapours afcending from the abyfs and pervading thofe ftrata, efpecially at fuch times as the fun's heat is fufficient to penetrate the exterior parts of the earth, and to make room for their efcape into the atmofphere. Thefe fulphureous, nitrous, and other active and volatile mineral particles, form various meteors, particularly thunder, lightning, and the other phænomena of a fiery nature. See EXHALATIONS, DAMPS, *&c.*

METHEGLIN, a drink prepared of honey, one of the moft pleafant and general drinks the northern parts of Europe afford. It is, according to Baily, made as follows: put as much new honey, naturally running from the comb, into fpring-water, as that, when the honey is thoroughly

roughly diffolved, an egg will not fink to the bottom, but be juft fufpended in it. Then boil the liquor for an hour or more, till fuch time as the egg fwim above the liquor; then take it off the fire, and let it cool. When very cool, next morning, it may be barrelled up; and adding to it half an ounce of ginger, as much of cloves, as much of mace, and a quarter of an ounce of cinnamon, all grofly pounded, a fpoonful of yeaft may be added alfo at the bung to increafe its fermentation. When it has done working, it may be clofely ftopped up, and after it has ftood a month it may be drawn off into bottles.

Metheglin, on its importation, pays a duty of 7 s. $8\frac{40}{100}$d. the hogfhead: and draws back, on exportation, 6 s. 9 d.

METHOD, μεθοδ☉, in logic, *&c.* the arrangement of our ideas in fuch a regular order, that their mutual connection and dependence may be readily comprehended. See IDEA and KNOWLEDGE.

The doctrine of method makes one of the fubdivifions of logic, which is always placed laft in order, becaufe it fuppofes a previous exercife of our other faculties of perception, judgment and reafoning, and fome progrefs made in knowledge before we can exert it in any extenfive degree. See the articles PERCEPTION, INTUITION, JUDGMENT, and REASONING.

The proper bufinefs, therefore, of method, is to diftribute our ideas into various claffes, combining into a regular fyftem whatever relates to one and the fame fubject, to afcertain the various divifions of human knowledge, and fo to connect the parts in every branch that they may feem to grow one out of another, and form a regular body of fcience, rifing firft from principles, and proceeding by an orderly concatenation of truths.

In this view of things it is plain, that we muft be before hand well acquainted with the truths we are to combine together; otherwife we could neither difcern their feveral connections and relations, nor fo difpofe of them as their mutual dependence may require.

But it often happens, that the underftanding is employed, not in the arrangement and compofition of known truths, but in the fearch and difcovery of fuch as are unknown: and here the manner of proceeding is very different, inafmuch as we affemble at once our whole ftock of knowledge relating to any fubject, and after a general furvey of things, begin with examining them feparately and by parts; and when, by fuch a fcrutiny, we have thoroughly informed ourfelves of the nature and contexture of each, we then compare them together in order to judge of their mutual action and influence.

Hence it appears, that in difpofing and putting together our thoughts, either for our own ufe, that the difcoveries we have made may at all times lie open to the review of the mind, or where we mean to unfold and communicate thefe difcoveries to others, there are two methods of proceeding equally within our choice: for we may fo propofe the truths relating to any part of knowledge, as they prefented themfelves to the mind in the manner of inveftigation, carrying on the feries of truths in a reverfe order, until they at laft terminate in firft principles; or beginning with firft principles, we may take the contrary way, and from them deduce, by a direct train of reafoning, the feveral propofitions we want to eftablifh. The former of thefe methods is termed, by logicians, the analytic method, or the method of refolution, in as much as it traces things backward to their fource, and refolves knowledge into its firft and original principles. The latter conftitutes what is called the fynthetic method, or the method of compofition; becaufe here we proceed by gathering together the feveral fcattered parts of knowledge, and combining them into one whole or fyftem, in fuch a manner that the underftanding is enabled diftinctly to follow truth through all her different ftages and gradations.

There is this farther to be taken notice of in relation to thefe two kinds of method, that the analytic has alfo obtained the name of the method of invention; becaufe it obferves the order in which our thoughts fucceed one another in the invention or difcovery of truth: whereas the fynthetic is often denominated the method of doctrine or inftruction, inafmuch as in laying our thoughts before others, we generally choofe to proceed in this manner, deducing them from their firft principles. For we are to obferve, that although there is great pleafure in purfuing truth in the method of inveftigation, becaufe it places us in the condition of the inventor, and fhews the particular train of thinking by which he arrived at his difcovery, yet it is not fo well accommodated to the purpofes of evidence and conviction, fince, at our firft fetting out, we are commonly unable to divine where the

the analyfis will lead us; and even after light begins to break in upon us, we are ftill obliged to many reviews, and a frequent comparifon of the feveral fteps of the inveftigation among themfelves: nay, when we have unravelled the whole, and reached the very foundation on which our difcoveries ftand, all our certainty, in regard to their truth, will be found, in a great meafure, to arife from that connection we are now able to difcern between them and firft principles, taken in the order of compofition. But in the fynthetic method of difpofing our thoughts the cafe is quite different: for as we here begin with intuitive truths, and advance by regular deductions from them, every ftep of the procedure brings evidence and conviction along with it; fo that in our progrefs from one part of knowledge to another, we have always a clear perception of the ground on which our affent refts. In communicating, therefore, our difcoveries to others, this method is apparently to be chofen, as it wonderfully improves and enlightens the underftanding, and leads to an immediate perception of truth: and hence it is called the method of fcience, becaufe all the parts of knowledge, which properly bear the name of fciences, are and ought to be delivered in it. See the article SCIENCE.

In order to proceed fuccefsfully in the analytic method, we muft endeavour, as much as poffible, to enlarge the capacity of the mind, by accuftoming it to wide and comprehenfive views of things; we muft alfo habituate ourfelves to a ftrong and unfhaken attention, which carefully diftinguifhes all the circumftances that come in our way, and lets nothing material flip its notice; in fine, we muft furnifh ourfelves with an ample variety of intermediate ideas, and be much in the exercife of fingling them out and applying them for the difcovery of truth. Thefe preparatory qualifications obtained, what further depends upon us lies chiefly in the manner of combining our perceptions, and claffing them with addrefs; and here the advantages of a proper notation are very great. See NOTATION, ANALYSIS, &c.

With refpect to the fynthetic or fcientifical method, the great fecret lies in fo managing and conducting our thoughts, as that their feveral relations may be laid open to the view of the underftanding, and become the unavoidable objects of our perception. In order to this, we muft make it our firft care diftinctly to frame and fettle the idea, about which our enquiries are to be employed: for as the relations fubfifting between them can no otherwife be difcerned, than by comparing them one with another; and as this comparifon neceffarily fuppofes, that the ideas themfelves are actually in the mind, and at that very time under our immediate infpection; it plainly follows, that all fcience muft begin with fixing and afcertaining thofe ideas. See IDEA. By this means alone, are thefe our more intricate notions kept diftinct and invariable; infomuch, that in all our feveral views of them, they ever have the fame appearance, and exhibit the fame habitudes and refpects. And here, properly fpeaking, the art of knowledge begins: for although we find it eafy enough to bound and fettle our ideas, where they confift of but a few perceptions, yet when they grow to be very complicated, it often requires great addrefs and management to throw them into fuch views as may prevent the confufion that is apt to arife from the joint confideration of a multiplicity of objects. To remedy this inconvenience, the fynthetic method teaches us to difpofe our perceptions into claffes, feriefes and genera; and as in advancing from one degree to another, we are always to proportion the number of notices united, to the ftrength and capacity of the mind, it is apparent, that by fuch a procedure, the ideas will be thoroughly afcertained in every ftep, and however large and bulky, lie neverthelefs fairly within our grafp. This obvioufly accounts for that wonderful clearnefs of apprehenfion which we often experience within ourfelves, even in regard to the moft complicated conceptions: for tho' the multitude of parts, in many cafes, be great, almoft beyond belief, yet as they have all previoufly been formed into feparate claffes and fubdivifions, all diftinctly fettled in the underftanding, we find it eafy by fuch a feries of fteps to rife to any idea, how complex foever, and with a fingle glance of thought embrace it in its full extent. See the articles CLASS, GENUS, &c.

But it is not enough that we barely form ideas in our minds; we muft alfo contrive a way not only to make them ftable and permanent, fo as to be able to recollect them with eafe and certainty, but alfo to unfold

unfold them to others; which is best done by well defined words. See the articles WORD and DEFINITION.

This foundation being laid, the communication of our complex conceptions, by definitions, becomes both easy and certain: for since the ideas themselves are formed into different orders, and these orders arise continually out of those combinations that constitute the classes next below them, so the definitions corresponding to these different orders, gradually take in the terms by which the several inferior divisions are regularly and successively expressed. In such a series of descriptions, it is evident, at first sight, that nothing can be obscure and unintelligible. For as it begins with the names of simple ideas, whose meaning is supposed to be known; and as in every order of definitions, such terms only occur as have been previously explained in the preceding distributions; by advancing regularly from one to another, we gradually furnish ourselves with whatever is necessary towards a distinct conception of all that is laid before us. Nor is it a small advantage attending this disposition, that the several ideas described are hereby excited in the understanding, in the very order and manner in which they are framed by a mind, advanced uniformly from simple to the most complicated notions. Hence we see distinctly the various dependence of things, and being put into that very train of thinking, which leads directly to science and certainty, are drawn insensibly to interest ourselves in the pursuit; insomuch that while in fact we do no more than follow a guide and conductor, we can yet hardly forbear fancying ourselves engaged in the actual exercise of deducing one part of knowledge from another.

When we have thus fixed and ascertained our ideas, and distinctly exhibited them in definitions, we then enter upon the important task of tracing their several relations; in order to which, we set about comparing them among themselves, and viewing them in a variety of lights: and here it happens, that some relations forwardly offer themselves to the notice of the understanding, and become the necessary objects of perception, upon the very first application of our ideas to one another; and, consequently, constitute our primary and intuitive judgments, being attended with the highest degree of evidence, and producing absolute certainty in the mind. But in many cases, the connection or repugnance between our ideas, even when real, comes not within our immediate view, but requires search and examination to discover it; and hence arises the necessity of reasoning and demonstration. See the articles REASONING, DEMONSTRATION, &c.

But what is particularly elegant and happy in the method above explained, we hereby see knowledge rising out of its first elements, and discern distinctly how those elements are interwoven, in order to the erecting a goodly superstructure of truth. Experience furnishes us with simple ideas and their names, which are the primary materials of thinking and communication. Definitions teach how to unite and bind these ideas together, so as to form them into complex notions of various orders and degrees. Intuitive truths constitute the fundamental principles of all knowledge, and the ultimate ground of certainty. Demonstrations link known truths together, in such a manner, that they necessarily lead to others unknown. Thus are we gradually led from simple ideas, through all the windings and labyrinths of truth, until we at length reach the most exalted discoveries of human reason. It is true, the method here laid down, hath hitherto been observed strictly, only among mathematicians; and is therefore, by many, thought to be peculiar to number and magnitude. But it appears evidently from what we have said above, that it may be equally applied in all such other parts of knowledge as regard the abstract ideas of the mind, and the relations subsisting between them.

As to the method to be observed in judging of the historical and experimental parts of our knowledge, see HISTORY and EXPERIMENTAL PHILOSOPHY.

The methods also of fluxions, of the differential calculus, of tangents, of finding the maximum, &c. may be seen under the articles FLUXION, CALCULUS DIFFERENTIALIS, &c.

METHODISTS, a name at first given to a society of religious young men at Oxford, and now applied to all those who adhere to the doctrine of the church of England as taught by Whitefield, Wesley, &c. They are said to be, in general, plain well-meaning people, who do not dissent from the established church; but profess to live with great purity, according to her articles. At their first appear-

ance their teachers were charged, in the heat of their zeal, with feveral irregularities, and many expreffions in their preaching which were not altogether unexceptionable; but as the civil government, with a moderation and wifdom peculiar to the prefent time, thought fit to overlook their behaviour, they have fince honeftly acknowledged wherein they were miftaken; and, in confequence of the perfect liberty of confcience they enjoy, have fubfided into a more regular and peaceable conduct, agreeable to the genuine fpirit of chriftianity.

METHODISTS, *Methodici*, is alfo an appellation given a fect of antient phyficians, who reduced the whole healing art to a few common principles or appearances. See the article PHYSICIANS.

They were alfo called Theffalici, as being the followers of Theffalus. Galen ftrenuoufly oppofed them, and fcrupled not to affert that the methodical herefy ruined every thing good in the art of phyfic.

METHODISTS, among botanifts, Linnæus defines to be thofe perfons who have attempted the ftudy of botany upon certain principles, and have beftowed their labours upon the difpofition and arrangement of plants, and allotting them proper and diftinctive names.

METOCHE, in antient architecture, a term ufed by Vitruvius to fignify the fpace or interval between the dentils. See the article DENTIL.

METONIC CYCLE, in chronology, the fame with the cycle of the moon. See the article CYCLE.

METONYMY, in rhetoric, is a trope in which one name is put for another, on account of the near relation there is between them. By this trope any of the moft fignificant circumftances of a thing are put for the thing itfelf. The metonymy is ufed with moft advantage in the following cafes. 1. When the narration ftands for the action, and what the poet or hiftorian defcribes, he is faid to do; which is a lively manner of expreffion, exceeding the common, as much as action goes beyond defcription, or life excels painting. 2. When the name of any relation is put for the duty it requires, and the benevolence and tendernefs that may be expected from it. Thus Anacreon fays, that thro' money there is no longer any fuch thing as brethren or parents in the world. 3. When the word which is ufed for a proper name, is either taken from the perfon's country, family, profeffion, perfonal circumftance, or refemblance to fome other; thus, as Sardanapalus was a monfter of debauchery, and Nero of cruelty, to call a very debauched perfon a Sardanapalus, and a cruel one Nero, brands them much deeper than to call one debauched, and the other cruel.

METOPE, *metopa*, in architecture, is the interval, or fquare fpace between the triglyphs of the doric frieze, which among the antients ufed to be painted or adorned with carved work, reprefenting the heads of oxen, or utenfils ufed in facrifices.

Mr. Le Clerc fays, that the beauty of metopes confifts in their regularity, that is, in their appearing as perfect fquares. He alfo obferves, that when the triglyphs and metopes follow each other regularly, the columns muft ftand one by one, except thofe of the inner angles, which ought always to be accompanied with two others, one on each fide; from which the reft of the columns may be placed at equal diftances from each other.

Semi-METOPE, in architecture, is a fpace in the corner of the doric frieze, fomewhat lefs than half a metope.

METOPOSCOPY, the pretended art of knowing a perfon's difpofitions and manners, by viewing the traces and lines in the face. Ciro Spontoni, who has wrote exprefsly on metopofcopy, fays, that feven lines are examined in the forehead, and that each line is confidered as having its particular planet: the firft is the line of Saturn, the fecond of Jupiter, the third of Mars, &c. Metopofcopy is only a branch of phyfiognomy, which founds its conjectures on all the parts of the body. See PHYSIOGNOMONICS.

METRE, μετρα, in poetry, a fyftem of feet of a juft length. See NUMBERS.

The different metres in poetry, are the different manners of ordering and combining the quantities, or the long and fhort fyllables; thus hexameter, pentameter, iambic, fapphic verfes, &c. confift of different metres, or meafures. See HEXAMETER, PENTAMETER, &c.

In englifh verfes, the metres are extremely various and arbitrary, every poet being at liberty to introduce any new form that he pleafes. The moft ufual are the heroic, generally confifting of five long and five fhort fyllables, and verfes of four feet, and of three feet, and a cæfura,

fura, or fingle fyllable. See the articles SYLLABLE and CÆSURA.

The antients, by varioufly combining and tranfpofing their quantities, made a vaft variety of different meafures, by forming fpondees, &c. of different feet. See the article FOOT.

METRETES, an antient meafure of capacity, containing a little more than nine gallons.

METRICAL, fomething relating to metre. See the article METRE.

METROCOMIA, in church-hiftory, a borough, or village, which had other villages under its jurifdiction; being the fame among villages, that a metropolis is among cities. See the following article.

METROPOLIS, the capital or principal city of a country or province.

The term metropolis is alfo applied to archiepifcopal churches, and fometimes to the principal or mother church of a city. The Roman empire having been divided into thirteen diocefes, and one hundred and twenty provinces, each diocefe and each province had its metropolis, or capital city, where the proconful had his refidence. To this civil divifion, the ecclefiaftical was afterwards adapted, and the bifhop of the capital city had the direction of affairs, and the preheminence over all the bifhops of the province. His refidence in the metropolis gave him the title of metropolitan. This erection of metropolitans is referred to the end of the third century, and was confirmed by the council of Nice. A metropolitan has the privilege of ordaining his fuffragans; and appeals from fentences paffed by the fuffragans, are preferred to the metropolitan.

METROPOLITAN. See the article METROPOLIS.

METZ, a city of Germany, in the dutchy of Lorrain, capital of the bifhopric of Metz, fituated thirty miles north of Nancy.

MEVAT, a province of India in Afia, north of Bengal, having the river Ganges on the weft.

MEULUN, a town of France, fituated on the river Seyne, fifteen miles north-weft of Paris.

MEURS, a town of Germany, in the circle of Weftphalia, and dutchy of Cleve, fituated on the river Rhine, fifteen miles north of Duffeldorp.

MEW, a place where a hawk is fet, during the time fhe raifes her feathers.

MEWING, the falling off, or change of hair, feathers, fkin, horns, or other parts of animals, which happens in fome annually, in others only at certain ftages of their lives: but the generality of beafts mew in the fpring. An old hart cafts his horns fooner than a young one, which is commonly in the months of February and March, after which they begin to button in March or April; and as the fun grows ftrong, and the feafon of the year puts forth the fruits of the earth, fo their heads grow, and are fummed full by the middle of June. It is to be obferved, that if a hart be gelt before he has a head, he will never have any, and if he be gelt after he has a head, he will never caft his horns; again, if he be gelt when he has a velvet-head, it will always be fo, without fraying, or burnifhing.

MEXICO, the metropolis of New Spain, at prefent, and formerly of the empire of Mexico, fituated in weft long. 103°, north lat. 20°.

This province of New Spain in America, is now divided into Old and New Mexico.

Old MEXICO, fituated between 83 and 116 degrees of weft long. and between 8 and 28° north lat. is bounded by New Mexico, or Granada, on the north; by the gulph of Mexico on the north-eaft; by Terra-firma on the fouth-eaft; and by the Pacific Ocean on the fouth-weft.

New MEXICO, including California, fituated between 100 and 140 degrees of weft long. and between the Tropic of Cancer and 48 degrees of north lat. is bounded by unknown lands on the north; by Florida on the eaft; by Old Mexico on the fouth; and by the Pacific Ocean on the weft.

MEZIERES, a town of France, in the Province of Champaign, fituated on the river Maes, in eaft longitude 4°, latitude 49° 55′.

MEZZOTINTO, a particular manner of reprefenting figures on copper, fo as to form prints in imitation of painting in indian ink.

The manner of making mezzotintos is very different from all other kinds of engraving and etching, fince inftead of forming the figures with lines and fcratches made with the point of a graver, or by means of aqua fortis, they are wholly formed by fcraping and burnifhing. Mezzotintos are made in the following manner: take a well-polifhed copper-plate, and beginning at the corner, rake or fur-

row the surface all over with a knife or instrument made for the purpose, first one way, and then the other, till the whole is of a regular roughness, without the least smooth part to be seen; in which state, if a paper was to be worked off from it at the copper-plate press it would be all over black. When this is done, the plate is rubbed over with charcoal, black chalk, or black lead, and then the design is drawn with white chalk, after which the out-lines are traced out, and the plate finished by scraping off the roughness, so as to leave the figure on the plate. The out-lines and deepest shades are not scraped at all, the next shades are scraped but little, the next more, and so on, till the shades gradually falling off, leave the paper white, in which places the plate is neatly burnished.

By an artful disposition of the shades, and different parts of a figure on different plates, mezzotintos have been printed in colours, so as nearly to represent very beautiful paintings.

MIASMA, among physicians, denotes the contagious effluvia of pestilential diseases, whereby they are communicated to people at a distance. See the articles CONTAGION, PLAGUE, *&c.*

MICA, GLIMMER, in natural history, a genus of talcs, otherwise called bractearium. See BRACTEARIA.

The bright appearance of the gold and silver glimmers, has led some to imagine, they were gold and silver ores; but the truth is, they contain not the least grain of either of these metals, being mere talc, accidentally coloured. See TALC.

MICAH, or the *Book of* MICAH, a canonical book of the Old Testament, written by the prophet Micah, who is the seventh of the twelve lesser prophets. He is cited by Jeremiah, and prophesied in the days of Jotham, Ahaz, and Hezekiah. He censures the reigning vices of Jerusalem and Samaria, and denounces the judgments of God against both kingdoms. He likewise foretells the confusion of the enemies of the Jews, the coming of the Messiah, and the glorious success of his church.

MICHAEL, or *Mount St.* MICHAEL. See the article MOUNT.

MICHAELMAS, or *Feast of St.* MICHAEL *and all Angels*, a festival of the christian church, observed on the 29th of September.

MICHELIA, in botany, a genus of the octandria-polygynia class of plants, the flower of which consists of eight acute lanceolated petals, less than the cup: the fruit consists of a number of globose unilocular berries, disposed in a cluster; in each of which there are four seeds, convex on one side, and angular on the other.

MICROCOS, in botany, a genus of the polyandria-monogynia class of plants, the calyx of which is a five leafed perianthium; the corolla consists of five very small leaves; the fruit is a roundish drupe, with one cell, in which is a bony, turbinated, fibrous seed.

MICROCOSM, μικρόκοσμος, a greek term, signifying the little world; used by some for man, as being supposed an epitome of the universe, or great world.

MICROGRAPHY, μικρογραφία, the description of objects, too minute to be viewed without the assistance of a microscope. See the article MICROSCOPE.

MICROLEUCONYMPHÆA, in botany, the same with the hydrocharis. See the article HYDROCHARIS.

MICROMETER, an astronomical machine, which, by means of a screw, serves to measure extremely small distances in the heavens, *&c.* and that to a great degree of accuracy.

The micrometer consists of a graduated circle, (plate CLXXI. fig. 5.) of a screw *qo*, and its index *qr*. The threads of the screw are such, that 50 make the length of one inch exactly. When it is to be used, the point *o* is set to the side of the part to be measured, and then the index is turned about with the finger, till the eye perceives the point has just passed over the diameter of the part; then the number of turns, and parts of a turn, shewn by the graduated circle, will give the dimensions in parts of an inch, as we shall shew by the following example: Suppose it required to measure the diameter of an human hair, and I observe the index is turned just once round, while the point *o* passes over it. Then it is plain the diameter of the hair in the image is $\frac{1}{50}$ of an inch. Now if the microscope, IDEF *def*, magnifies 6 times, or makes the image 6 times larger in diameter than the object, then is the diameter of the hair itself but $\frac{1}{6}$ of $\frac{1}{50}$, that is, but $\frac{1}{300}$ part of an inch.

Also it is to be observed, that as there are 10 large divisions, and 20 small ones, on

on the micrometer-plate, fo each of thofe fmall divifions are the $\frac{1}{20}$ of $\frac{1}{50}$, or the $\frac{1}{1000}$ part of an inch. Therefore, if, in meafuring any part of an object, you obferve how many of thefe fmaller divifions are paffed over by the index, you will have fo many thoufandth parts of an inch for the meafure required. All which is fo plain, that nothing can be faid to illuftrate the matter.

MICROPUS, in botany, a genus of the fyngenefia polygamia neceffaria clafs of plants, with a paleaceous receptacle, but no pappus or down to the feeds; and the corolla is of the naked kind, or has no radius: the flowers are fmall, and ftand on the extremities of the branches.

MICROSCOPE, an optical inftrument, by means whereof very minute objects are reprefented, exceedingly enlarged, and are viewed very diftinctly according to the laws of refraction, or reflection. See Refraction and Reflection.

Microfcopes are either fingle or double; a fingle microfcope is only a very fmall globule of glafs, or a fmall double convex glafs, whofe focal diftance is very fhort. A minute object *p q* (plate CLXXII. fig. 1. n° 1.) feen diftinctly through a fmall glafs A E by the eye put clofe to it, appears fo much greater than it would to the naked eye, placed at the leaft diftance *q* L from whence it appears fufficiently diftinct, as this latter diftance *q* L is greater than the former *q* E. For having put your eye clofe to the glafs E A, in order to fee as much of the object as poffible at one view, remove the object *pq* to and fro till it appears moft diftinctly, fuppofe at the diftance E *q*. Then conceiving the glafs A E to be removed, and a thin plate, with a pin-hole in it, to be put in its place, (*ib.* n° 2.) the object will appear diftinct, and as large as before, when feen through the glafs, only not fo bright. And in this latter cafe, it appears fo much greater than it does to the naked eye, at the diftance *q* L, either with the pin-hole or without it, as the angle *p* E *q* is greater than the angle *p* L *q*, or as the latter diftance *q* L is greater than the former *q* E. Since the interpofition of the glafs has no other effect than to render the appearance diftinct, by helping the eye to increafe the refraction of the rays in each pencil, it is plain that the greater apparent magnitude is entirely owing to a nearer view than could be taken by the naked eye. If the eye be fo perfect as to fee diftinctly by pencils of parallel rays falling upon it, the diftance, E *q*, of the object from the glafs, is then the focal diftance of the glafs. Now if the glafs be a fmall round globule whofe diameter is $\frac{1}{15}$ of an inch, its focal diftance E *q* being three quarters of its diameter, is $\frac{1}{20}$ of an inch; and if *q* L be eight inches, the ufual diftance at which we view minute objects, this globule will magnify at the rate of 8 to $\frac{1}{20}$ or of 160 to 1.

In microfcopes made with fingle lenfes, a given object placed at their principal focufes will appear equally diftinct, if their linear apertures be as their focal diftances. And in microfcopical lenfes, whofe focal diftances are not much longer than half an inch, there is no need to contract their apertures, for procuring diftinct vifion; the pupil itfelf being fmall enough to exclude the exterior ftraggling rays. But in fmaller lenfes, where apertures are neceffary, to preferve the fame degree of diftinctnefs, their diameters muft be as their focal diftances; and then the apparent brightnefs will decreafe in a duplicate ratio of their focal diftances, fo that by ufing fmaller glaffes the apparent magnitude and the obfcurity of the object will both increafe in the fame ratio.

A double microfcope is compofed of two convex glaffes placed at E and L, (*ibid.* fig. 2.) The glafs L next the object P Q is very fmall and very much convex, and confequently its focal diftance L F is very fhort; the diftance L Q of the fmall object P Q, is but a little greater than L F; fo that the image *pq*, may be formed at a great diftance from the glafs, and confequently may be much greater than the object itfelf. This picture *p q* being viewed through a convex eye-glafs A E, whofe focal diftance is *q* E, appears diftinct. Now the object appears magnified upon two accounts; firft, becaufe if we viewed its picture *p q* with the naked eye, it would appear as much greater than the object, at the fame diftance, as it really is greater than the object, or as much as L *q* is greater than L Q; and fecondly, becaufe this picture appears magnified through the eye-glafs as much as the leaft diftance at which it can be feen diftinctly with the naked eye, is greater than *q* E, the focal diftance of the eye-glafs. For example, if this latter ratio be 5 to 1, and the former ratio of L *q* to L Q be 20 to 1, then upon both accounts the object

object will appear 5 times 20, or 100 times greater than to the naked eye.

To fit theſe microſcopes to ſhort-ſighted eyes, the glaſſes E and L muſt be placed a little nearer together; ſo that the rays of each pencil may not emerge parallel, but may fall diverging upon the eye; and then the apparent magnitude will be altered a little, but ſcarce ſenſibly.

To make glaſs globules for MICROSCOPES. Mr. Butterfield, in the Philoſophical Tranſactions, n° 141, ſays, he had tried ſeveral ways of making glaſs-globules of the bigneſs of great pin-heads and leſs, as in the flame of a candle made of tallow or wax; but that the beſt ſort of flame for making them clear and without ſpecks, was that of a lamp made with rectified ſpirit of wine, where inſtead of a cotton wick, he made uſe of fine ſilver-wire, doubled up and down like a ſkein of thread. Then having prepared ſome fine glaſs, beaten to powder and waſhed very clean, he took a little of it upon the ſharp point of a ſilver-needle wetted with ſpittle, and held it in the flame, turning it about till it melted and became quite round, but no longer, for fear of burning it. The art lies in giving the globule an exact roundneſs, which can only be learned by experience. When a great many globules are thus formed, he rubs them clean with a ſoft leather. Then having ſeveral ſmall pieces of thin braſs-plates, twice as long as they are broad, he doubles them up into the form of a ſquare, and punches a fine hole through the middle of them: and having rubbed off the bur about the holes with a whetſtone, and blacked the inſides of the plates with the ſmoke of a candle, he places a globule between the two holes, and tacks the plates together with two or three rivets. Then he tries how they magnify ſmall objects; and keeps the beſt of them for uſe.

Dr. Hook uſed to take a very clear piece of glaſs, and to draw it out into long threads in a lamp; then he held theſe threads in the flame till they run into round globules hanging to the end of the threads. Then having fixt the globules with ſealing wax to the end of a ſtick, ſo that the threads ſtood upwards, he ground off the ends of the threads upon a whetſtone, and poliſhed them upon a ſmooth metal-plate with a little putty.

Mr. Stephen Gray, in the Philoſophical Tranſactions, n° 221, 223, ſays, that for want of a ſpirit lamp, he laid a ſmall particle of glaſs, about the bigneſs of the intended globule, upon the end of a charcoal; and by the help of a blaſt-pipe, with the flame of a candle, he ſoon melted it into a globule. By this means he made them indifferently clear, and the ſmalleſt very round; but the larger, by reſting upon the coal, were a little flatted, and received a roughneſs on that ſide. Therefore he was wont to grind and poliſh them upon a braſs plate, till he reduced them to hemiſpheres. But he found that the ſmall round globules, beſides that they magnified more, ſhewed objects more diſtinct than the hemiſpheres.

Mr. Wilſon's pocket-microſcope, has nine different magnifying glaſſes, eight of which may be uſed with two different inſtruments, for the better applying them to various objects. One of theſe inſtruments is repreſented by A A B B (*ibid.* fig. 3. n° 1.) and is made of ivory or braſs; it has three thin braſs-plates at E, and a ſpiral ſpring of ſteel-wire H within it; to one of the thin plates of braſs is fixed a piece of leather F, with a ſmall furrow G both in the leather and braſs to which it is fixed: in one end of this inſtrument is a long ſcrew D, with a convex glaſs C, placed in the end of it: in the other end of the inſtrument there is a hollow ſcrew *o o*; wherein any of the magnifying glaſſes, M, (*ib.* n° 2.) are ſcrewed when they are to be made uſe of. The nine different magnifying glaſſes are all ſet in ivory, eight of which are ſet in the manner expreſſed at M. The greateſt magnifier is marked upon the ivory wherein it is ſet, with n° 1. and ſo on to n° 8; the ninth glaſs is not marked, but is ſet in the manner of a little barrel-box of ivory, as at *b.* (*ib.* n° 3.) At *e e*, is a flat piece of ivory, (*ib.* n° 4.) whereof there are eight belonging to this microſcope, tho' any one may have as many as he pleaſes; in each of them are three holes *f f f*, wherein three or more objects are placed between two thin glaſſes, or pieces of talc, when they are to be uſed with the greater magnifiers.

The uſe of this inſtrument A A B B is this: having taken the handle W from the inſtrument (*ib.* n° 5.) and ſcrewed it upon the button S in n° 1. take one of your flat pieces of ivory *e e*, or ſliders, and ſlide it betwixt the two thin plates of braſs at E, through the body of the microſcope, ſo that the object you intend to look upon be juſt in the middle; re-

marking


Ayscough's Single and Compound MICROSCOPE, for viewing both transparent and opake Objects.
W
O
N
P
X
F
K
B
l
m
c
r
h
I
T
o
Q
V
i
A
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e
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L
p
q
R
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C
Y
Y
T. Jefferys sculp

marking that you put that ſide of the plate *ee*, where the braſs rings are, fartheſt from the end AA: then you are to ſcrew into *oo* (the hollow ſcrew in the end of your microſcope) the 3d, 4th, &c. magnifying glaſs M; which being done, put the end AA cloſe to your eye, and while you are looking through your magnifying glaſs upon the object, you are to ſcrew in or out the long ſcrew D, which moving round upon the leather F, held tight to it by the ſpiral wire H, will bring your object to the true diſtance; which you will know by ſeeing it clearly and diſtinctly: after this manner may be ſeen all tranſparent objects, duſts, liquids, cryſtals of ſalts, ſmall inſects, &c.

The other inſtrument (*ib.* 5.) is made of braſs, with joints PPP to turn eaſily any way, and with a ſmall pair of tongs GG, which open at the points K, by preſſing together the two heads of the pins II, for taking up of objects. At the other end of theſe tongs GG, is ſcrewed on a piece of black wood H, with a piece of ivory ſet into it, for placing opake objects on, according to their difference of colour. Upon the end L there is a ſcrew, upon which the glaſs *b* (n° 3.) ſet in the barrel-box, may be ſcrewed. When the other glaſſes are to be uſed, there is a ring R of braſs to be ſcrewed on the end L, into which ring all the other glaſſes M, may be ſcrewed. So when any object is taken up in the point of the tongs K, or laid upon the other end H, it may very eaſily be applied to the true focal diſtance of any of the glaſſes M, by the help of the joints PPP, and by means of the ſcrew C, with the wheel D, which being regulated by a ſpring N, will bring the objects to the exact diſtance for diſtinct viſion.

The glaſs placed in the manner of a barrel-box at *b*, (*ib.* n° 3.) is only to be uſed with the braſs-inſtrument, or in your own hand, being the leaſt magnifier, for greater objects, ſuch as flies and common inſects, &c. remembering to put the hole *b* next to your eye.

The ingenious Mr. Ayſcough has contrived a microſcope, which may be uſed either with a ſingle or with compound lenſes, and that for opake as well as tranſparent objects.

Being taken out of the box YY, and fitted for obſervation, it ſtands as in plate CLXXIII. the bottom of the pillar A being fixed in the ſocket *a*, and faſtened by the ſcrew *b*; the body of the microſcope, B, fixed in the collar *c*; and the illuminator, C, placed underneath the ſtage at *d*.

If an object in an ivory-ſlider is to be viewed, the apparatus D is to be fixed in the center of the ſtage E. This done, ſuch a magnifier, F, as is moſt proper in proportion to the ſize of the object, is to be applied to the end of the tube *e*: ſuppoſe the magnifier n° 1. be uſed, the upper edge of the collar *f* muſt be ſet to the ſame number on the pillar A; and if not perfectly diſtinct, the button *g* muſt be ſcrewed tight; and then, by a turn or two of the button *h*, it is adjuſted to the focus with the greateſt exactneſs: and ſo of the other magnifiers. But when the object is placed above or beneath the ſtage, no regard muſt be had to the number on the pillar A; but the pillar G, that carries the object, is to be moved higher or lower, till the object is ſeen nearly diſtinct, and then it is to be adjuſted as before.

Whenever the 1ſt, 2d, or 3d magnifier is uſed, the cone H muſt be placed at the bottom of the ſtage, whereby the object is rendered much more diſtinct. And to ſave the trouble of often ſcrewing and unſcrewing the magnifiers, let three or four of them be ſcrewed to the plate I, which ſlides in the dove-tail of the plate K. If the object to be viewed be a fiſh, place its tail over the hole at the end of the braſs plate L; and then by ſlipping the button *i* into the ſlit *k* on the ſtage, it will be fixed under the bottom of the microſcope. Frogs, &c. muſt be placed in the glaſs tube M. The braſs-cup N, with a glaſs-bottom, is made to contain any fluid for viewing aquatic objects: and to ſecure any object for obſervation, confine it between the glaſſes in the box O.

Theſe are the parts for viewing tranſparent objects; and thoſe for opake ones are a ſilver-ſpeculum, which ſcrews into the end of the braſs-cylinder P, at *l*: and here the fourth, fifth, and ſixth, are the moſt proper magnifiers. Moſt inſects may be confined by the forceps *m*, at the end of the ſteel-wire Q; or, on the point *n*. To view objects by candle-light, place them on the piece R, which muſt be laid on the ſtage, where they will be illumined by the lens S, ſupported by the ſtem *pq*.

The method of uſing this microſcope with ſingle lenſes, is this: the body of the

the compound microfcope muft be taken out of its collar *c*, and the apparatus D placed in the fame; the ftem, *r*, muft be turned over the ftage, to fupport the magnifiers; the brafs plate T, with a hole to receive the illuminator, C, muft be fixed in the center of the ftage; all the magnifiers, except V, fcrew in underneath the ftem *r*; but this, and all others with covers, fcrew in above it. W is a filver-fpeculum, ufed in this apparatus; and X is a forceps, to take up any object with.

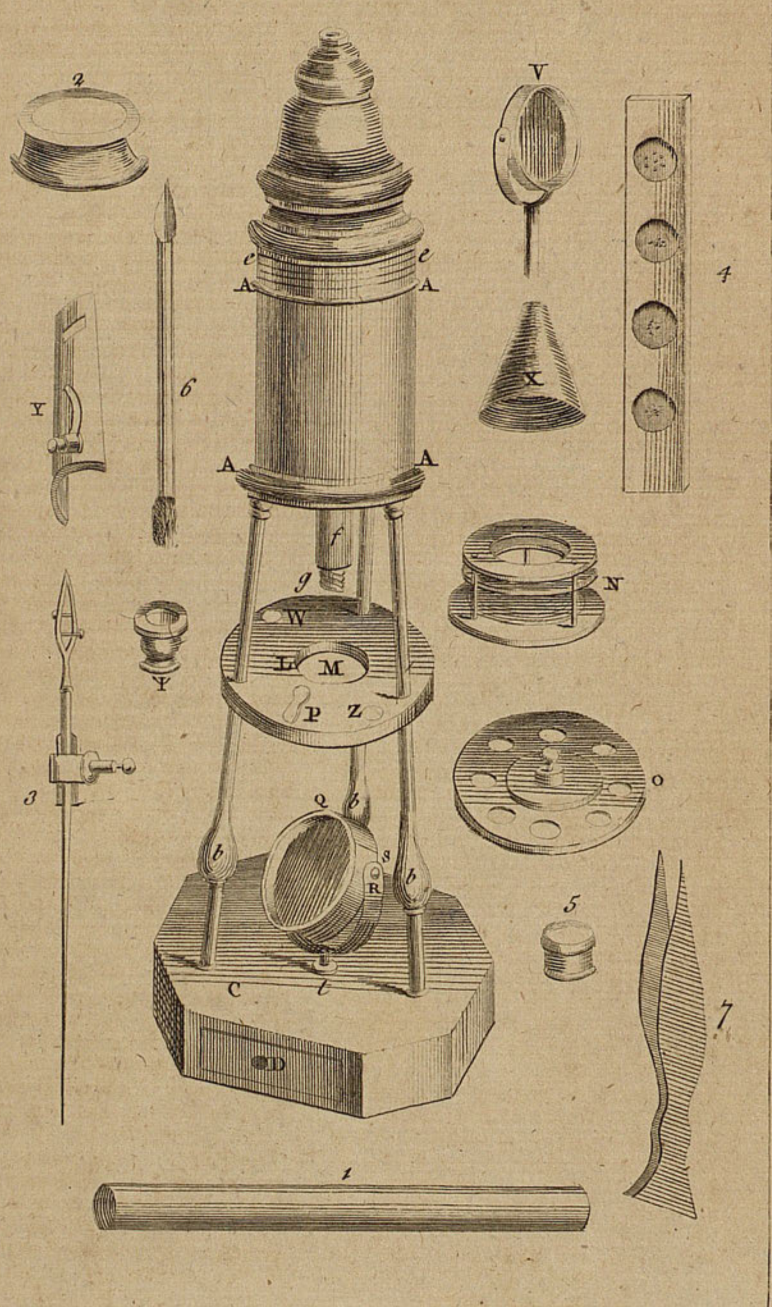
Double reflecting MICROSCOPE, in ufe at prefent, is an alteration and improvement by Mr. Culpepper and Mr. Scarlet, of Mr. Marfhal's large double microfcope; than which it is lefs cumberfome, may be managed with much more eafe, and by means of a reflected light, is capable of fhewing objects in a clearer and more pleafing manner. The body of this microfcope, A A A A, (plate CLXXIV.) being a large tube, is fupported by three brafs-pillars *b b b*, rifing from a wooden pedeftal C; in which pedeftal there is a drawer D, to hold the object-glaffes, and other parts of the apparatus.

A leffer tube *e e*, flides into the greater, and fends from its bottom another tube much fmaller than itfelf, *f*, with a male fcrew at the end thereof, whereon to fcrew the object-glafs or magnifier. There are five of thefe magnifiers numbered 1, 2, 3, 4, 5, which numbers are alfo marked on the inner tube, to direct whereabout to place it according to the magnifier made ufe of: but if then it fits not the eye exactly, flide the inner tube gently higher or lower, or turn the fcrew of the magnifier gradually till the object appears diftinct. O is a round brafs-plate with feveral holes for placing objects in, but two holes are commonly referved for fmall concave-glaffes, whereon to place a drop of any liquid, in order to view the animalcules, &c. There is alfo a piece of white ivory, and a piece of black ebony, of the fame fize and fhape as the holes for objects: the ivory is to put opake objects on that are black, and the ebony is to receive fuch as are white; by which contrariety of colours they will be feen more clearly. Q is a concave looking-glafs, which reflects the light of a candle, or the fky, directly upwards on the object to be viewed. V is a plano-convex lens, which ferves to tranfmit the light of a candle or fun-fhine upon any opake object which is placed on the ivory or ebony for examination.

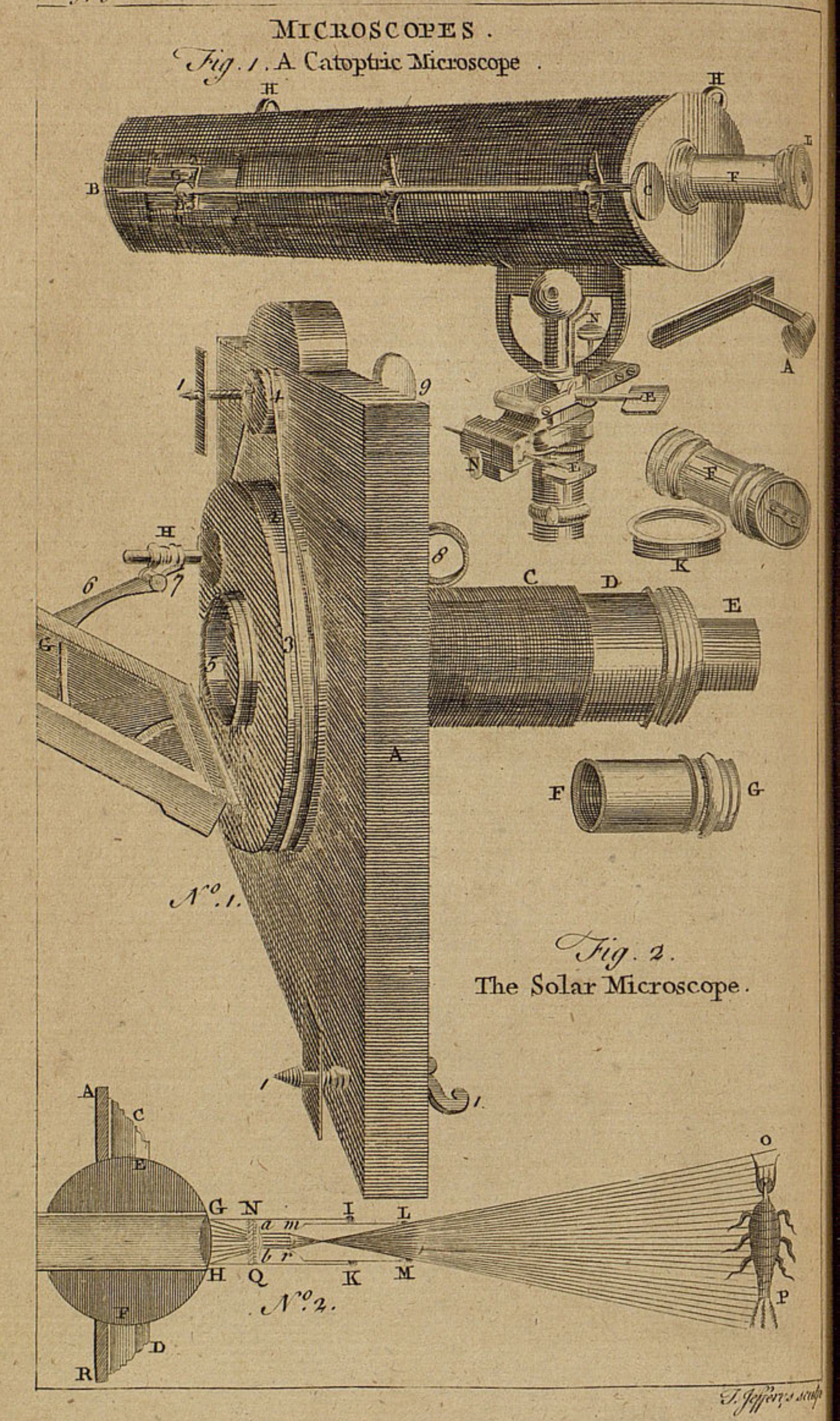
The folar or camera obfcura MICROSCOPE, depends on the fun-fhine, and muft be made ufe of in a darkened-chamber, as its name implies. This inftrument confifts of feveral parts, *viz.* A (plate CLXXV. fig. 2.) a fquare frame of mahogany to be fixed to the fhutter of a window, by means of the fcrews 1, 1. To this frame is applied a circular collar of the fame wood, with a groove on its periphery on the outfide, denoted by 2, 3. This collar is connected by a cat-gut to the pully 4 on the upper part, which is turned round by the pin 9 within. On one part of the collar, on the outfide, is faftened, by hinges, a looking-glafs G, in a proper frame, to which is fixed the jointed wire 6, 7; by which means, and the fcrew H 8, it may be made to ftand in an angle more or lefs inclined to the frame. In the middle of the collar is fixed a tube of brafs C, near two inches in diameter; the end of which, on the outfide, has a convex lens 5 to collect the fun-beams thrown on it by the glafs G, and converging them towards a focus in the other part, where D is a tube fliding in and out to adjuft the object to a due diftance from the focus. To the end G of another tube F, is fcrewed one of Wilfon's fingle pocket-microfcopes, containing the object to be magnified in a flider; and by the tube F, fliding on the fmall end E of the tube D, it is brought to a due focal diftance.

The fun's rays being directed by the looking-glafs through the tube upon the object, the image or picture of the object is thrown diftinctly and beautifully upon a fcreen of white paper, or a white linen fheet, placed at fome diftance to receive the fame; and may be magnified to a fize beyond the imagination of thofe who have not feen it. For the farther off the fcreen is removed, the larger will the object appear, infomuch that a loufe may be magnified to the length of five or fix feet, or even a great deal more; but it is more diftinct when not enlarged to above half that fize.

This inftrument has been contrived very commodioufly in feveral different forms; but we fhall here illuftrate the following by a diagram. A R (*ibid.* n° 2.) is a fection of the window-fhutter of a dark room,



T. Jefferys sculp


MICROSCOPES.
Fig. 1. A Catoptric Microscope.
Fig. 2.
The Solar Microscope.
No. 1.
No. 2.
T. Jefferys sculp

room, CD of the frame containing a scioptric ball EF; in the forepart whereof is screwed the tube GIKH, at one end of which is a lens GH, which, by converging the sun-beams into a narrow compass, does strongly enlighten the small object *a b*, placed on a slip of glass, or otherwise, in the part of the tube NQ, where a slit is made on each side for that purpose. Within this tube there slides another, L*mr*M, which contains a small magnifying lens *mr*. By moving the exterior tube, IGHK, one way and the other, the glass GH will be brought to receive the rays of the sun directly, and will therefore most intensely illuminate the object *ab*. The other tube, LM, being slid backwards and forwards, will adjust the distance of the smaller lens *mr*, so that the image of the object *a b* shall be made very distinct, on the opposite side of the room at OP; and the magnitude of the image will be to that of the object, as its distance from the lens *mr* is to the distance of the object from it, as is evident from the figure.

Thus, for example, suppose the focal distance of the lens *mr* to be one inch $= r$, and let the distance at which it is placed from the object be 1, $1 = d$; then, if the lens be double and equally convex, as usual, the distance of the image will be $\frac{dr}{d-r} = f = 110$; therefore the image will be 110 times larger than the object in its linear dimensions, and $110 \times 110 = 12100$ times larger in surface; and in solidity it will be $110 \times 110 \times 110 = 1331000$ times larger than the object.

This is the most entertaining of any; and, perhaps, the most capable of making discoveries in objects that are not too opake, as it shews them much larger than can be done any other way. Such too as have no skill in drawing, may, by this contrivance, easily sketch out the exact figure of any object they have a mind to preserve a picture of.

The MICROSCOPE *for opake objects*, remedies the inconvenience of having the dark side of an object next the eye, which has hitherto been an unsurmountable obstruction to the making observations on opake objects with any considerable degree of exactness or satisfaction: and notwithstanding ways have been tried to point light upon an object from the sun or a candle, by a convex glass placed on the side thereof; yet the rays from either can be thrown upon it in such an acute angle only, that they serve to give a confused glare, but are insufficient to afford a clear and perfect view of the object. But in this new microscope, by means of a concave speculum of silver, highly polished, in whose center a magnifying lens is placed, so direct and strong a light is reflected upon the object, that it may be examined with all imaginable ease and pleasure.

Catoptric MICROSCOPE. Though microscopes composed of refracting glasses only have been vastly improved as to their effects of magnifying, yet they have been attended with such great inconveniencies, that their application to many arts, in which they might be very convenient, is not so common as might be expected. There is a catoptric microscope described in the Philosophical transactions, n° 442. which remedies most of the defects of the others, and is made on the model of the newtonian telescope. This microscope magnifies from the distance of nine to twenty-four inches. The manner of using this instrument as a microscope is this: when it is fixed on its stand, the small speculum A (plate CLXXV. fig. 1.) must be thrust home in its slider, in the inside of the mouth of the instrument B, and the screw C turned till the index D cuts one of the numbers at M; then the mouth of the instrument B must be removed from the object the distance in inches expressed by that number, and be directed towards the object, by looking through the hole in the great speculum; the tube that holds the eye-glasses being taken off, and adjusting it by means of two racks E and E, in such manner, that the image of the object may be visible in the middle of the little speculum: then the tube F, holding the eye-glass, must be screwed on, and the small eye-hole in the little brass-plate, which turns on a pivot, applied.

N. B. As the same adjustment of the speculum will not suit all eyes, the screw C must be turned round to the right or left a little, till the object appears distinct. This instrument, besides its use as a microscope, is convertible into a gregorian telescope, by changing the small speculum for one of a different focus.

MIDAS-EAR-SHELL, the smooth ovato-oblong buccinum, with an oblong and very narrow mouth. It consists of six volutions, but the lower one alone makes up almost the whole shell. See BUCCINUM.

MID-HEAVEN, the point of the ecliptic

that culminates, or in which it cuts the meridian.

MIDDLEBURG, the capital city of Zealand, one of the United Provinces, situated in the island of Walcherin, twenty-six miles north-east of Bruges.

MIDDLEBURG, a castle of dutch Flanders, eight miles north-east of Bruges.

MIDDLEHAM, or MIDHAM, a market-town in the north riding of Yorkshire.

MIDDLESEX, a county of England, in which London, the metropolis, stands; it is twenty-four miles long, and only fourteen broad, and is bounded by Hertfordshire, on the north; by the river Lea, which divides it from Essex, on the east; by the river Thames, which separates it from Surry, on the south; and by the brook Coln, which divides it from Buckinghamshire, on the west. See the article LONDON.

MIDDLEWICH, a market-town of Cheshire, fifteen miles east of Chester.

MIDHURST, a borough-town of Sussex, ten miles north of Chichester; which sends two members to parliament.

MIGRATION, the passage or removal of a thing out of one state into another. See TRANSMIGRATION and PASSAGE.

MILAN, the capital of the Milanese, or dutchy of Milan, in Italy: east long. 9° 30′, north lat. 45° 25′.

MILAZZO, or MELAZZO, a port-town of Sicily, thirty miles north-west of Messina.

MILBORN-PORT, a borough-town of Somersetshire, twenty-five miles south of Bath. It sends two members to parliament.

MILDENHALL, a market-town of Suffolk, ten miles north-west of Bury.

MILDEW, *rubigo*, a disease happening to plants, caused by a dewy moisture, supposed by some to be a species of blight. See the article BLIGHT.

MILE, *mille passus*, a measure of length or distance, containing eight furlongs, *&c.* See the article MEASURE.

The english statute mile is fourscore chains, or 1760 yards; that is, 5280 feet. See CHAIN, YARD, and FOOT.

We shall here give a table of the miles in use among the principal nations of Europe, in geometrical paces, 60,000 of which make a degree of the equator.

	Geometrical paces.
Mile of Russia	750
of Italy	1000
of England	1250
of Scotland and Ireland	1500
Old league of France	1500
The small league, *ibid.*	2000
The mean league, *ibid.*	2500
The great league of France	3000
Mile of Poland	3000
of Spain	3248
of Germany	4000
of Sweden	5000
of Denmark	5000
of Hungary	6000

MILFORD-HAVEN, the most commodious harbour in Great-Britain, situated in the south-west part of Pembrokeshire in Wales, at the north entrance of the Bristol-channel.

MILIARY, in general, something resembling millet-seeds.

Anatomists give the name miliary-glands to numerous spherical bodies, each with an excretory duct, found in the nose, the eye-lids, the ears, the nipples, under the arm-pits, and in the cutis of the penis and scrotum, the pudenda of women, and about the anus: but they are found to vary extremely, both as to size and number, in different persons; and Heister, Boerhaave, Ruysch, and others, declare, that these globose bodies are not true glands, but only certain secretory ducts from the arteries of the skin; which either from the density of the cuticle in those parts, or from the thickness of the matter contained in them, becoming obstructed, are thereby formed into these tubercles.

MILIARY-FEVER, a malignant fever, so called from the eruption of certain pustules resembling millet-seeds.

It begins with a slight shivering, succeeded by heat and loss of strength, sometimes even to faintness; there is a straitness and anxiety about the breast, attended with deep sighs, restlessness, and disturbed sleep; and to these succeed a roughness of the skin like that of a goose, and a great number of pustules appear, sometimes white and sometimes red, or both together, of the size of a millet or mustard-seed. They first beset the neck, then the breast and back, and afterwards the arms and hands: and when these appear, the other symptoms gradually go off; the pustules ripening, and containing a stinking ichor. These pustules appear on the third, fourth, seventh, or sometimes not till the fourteenth day.

The principal intention of cure, is to expel and keep out the morbific matter which forms the pustules; for it is often fatal

fatal when the puftules difappear, and cannot be driven out again. Bleeding fhould be cautioufly ufed; and the patient fhould not rife out of bed, or continue long in an erect pofture, for fear of fainting, or ftriking the puftules in: analeptic medicines are neceffary to keep up the fpirits; and to thefe may be added, according to circumftances, gentle diaphoretics. Some greatly commend diaphoretic antimony, for promoting the difcharge of the puftules, and to take off a delirium; the dofe being a fcruple every fixth hour. Hoffman recommends blifters, applied to the legs, for the fame purpofe.

Hamilton's method of cure is to give the teftaceous powders, which keep up a moderate warmth, abforb the acidity of the blood, and promote a breathing fweat: take of powder of crab's claws and fperma-ceti, each one fcruple; of faffron, five grains; and of the pectoral fyrup as much as is fufficient to make into a bolus, to be taken every fixth hour. Blifters are alfo neceffary through the whole courfe.

MILITANT, or CHURCH-MILITANT, denotes the body of chriftians while here on earth. See the article CHURCH.

MILITARY, fomething belonging to the foldiery or militia.

MILITARY ARCHITECTURE, the fame with fortification. See FORTIFICATION.

MILITARY ART, the fcience or art of making or fuftaining war to advantage.

MILITARY WAYS, *viæ militares*, the large roman roads which Agrippa procured to be made through the empire in Auguftus's time, for the marching of troops and conveying of carriages. Thefe were paved from the gates of Rome, to the utmoft limits of the empire. See ROAD.

MILITIA, in general, denotes the body of foldiers, or thofe who make profeffion of arms.

In a more reftrained fenfe, militia denotes the trained bands of a town or country, who arm themfelves, upon a fhort warning, for their own defence. So that, in this fenfe, militia is oppofed to regular or ftated troops.

For the direction and command of the militia, the king conftitutes lords-lieutenants of each county.

MILIUM, MILLET. See MILLET.

MILK, *lac*, a well known animal fluid, which nature prepares in the breafts of women, and the udders of other animals, for the nourifhment of their young. Milk, according to Boerhaave, is a liquor prepared from the aliment chewed in the mouth, digefted in the ftomach, perfected by the force and juices of the inteftines, and elaborated by means of the mefentery and its gland and juices, and the juices of the thoracic duct. It has undergone fome actions of the veins, arteries, heart, lungs, and juices, and began to be affimilated; yet may ftill be had feparate and difcharged out of the body. And thus by their own milk, prepared from the proper matter of the chyle, all the known lactiferous animals are nourifhed, both male and female. For milk is always prepared from chyle as well in men as in women, in virgins and barren women, in mothers and nurfes. Whence every fuch animal confifts, is nourifhed, and lives on its own proper milk; and from this alone prepares all the other parts, both the folid and fluid, by means of the vital actions. It is alfo certain that many live for years by feeding on milk alone, and perform all the actions of life, and have all the folid and fluid parts of their bodies perfectly elaborated: the ferum, therefore, the blood, the lymph, the fpirits, bones, cartilages, membranes, and veffels, proceed from milk; and milk muft contain in itfelf the matter of all the parts of the human body. Milk approaches nearer to an animal nature than chyle. See CHYLE and CHYLIFICATION.

If milk be good, and fuffered to reft in a clean veffel, it firft appears uniformly white; then throws up a white, thick, unctuous cream to its furface, and remains fomewhat bluifh below. The milks of all the known animals have thefe properties alike. The human milk is very fweet and thin, the next is that of affes, then that of mares, then of goats, and laftly of cows: whence it is prefcribed in this order to confumptive perfons of weak vifcera. The rennet prepared of the juices of fuch creatures as chew the cud being mixed with milk, coagulates it into an uniform mafs, which may be cut with a knife, and it thus fpontaneoufly feparates into whey and curds; if long boiled over the fire, it lofes its more fluid parts, and condenfes into a butyraceous and cheefy mafs.

It may be fhewn from reafon, without the evidence of experience, that milk is an efficacious remedy in diforders of the

breaft.

breast. But it is to be observed, that all milks are not of the same kind, and of the same efficacy for all purposes: since, according to the diversity of animals and their respective foods, they are possessed of different and peculiar qualities which are to be considered apart. First, then, asses-milk, which was always greatly esteemed by the antients, contains a great deal of sweet serum, but a very small quantity of earthy, caseous, and pinguious substance, for which reason it is not easily coagulated, and, consequently, but very unfit for butter and cheese. Its whey is astringent, laxative, moistening, and proper for correcting the acrimony of the humours. Goats-milk does not contain so large a quantity of whey as that of asses, nor is it of so laxative and astringent a nature, but of a thicker consistence. And, as goats eat the leaves of trees which contain something of a resinous quality, their milk is very efficacious for the consolidation of suppurated parts. Cows-milk is more pinguious, contains a large quantity of earth, but less whey, for which reason it generally yields a great deal of butter and cheese. This species of milk is of a temperating, nutritive, and consolidating virtue. Women's milk, for medicinal purposes, is preferable to all others; for it is the sweetest of them all, and its nutritive quality is sufficiently observable in infants. The virtues of milk are also different, according to the diversity of herbs and pasturage, which animals eat. Hence milk in the spring is highly salutary, because at that time the vegetables abound with temperate juices; whereas milk in the winter is accounted less salutary, because the animals feed on hay and straw. According to Quincy, milk is very proper to alter a sharp thin blood into a crasis more soft, balsamic, and nutritive; and in the constitutions, where it agrees in the first passages, it cannot but be proper for such an end, as being already prepared into nourishment as far as is required for its admission into the blood. Where milk of what kind soever is ordered in consumptions, and as a restorative, it is with very good reason joined with the testacea, and such things as are proper to destroy acidities. As for the difference of milks from the different creatures which produce them, there seems as much owing to their different food and manner of living, as to any specific difference in the creatures themselves. That which is most common in our food, cow's milk, seems to be of the most substance and most nutritive of all. In the use of these there is a great deal in being more or less accustomed to any particular sort; for at first, with many, it is frequently purgative, but this does not continue. In short, experience is the best guide in these courses, and physicians of the best skill and penetration sometimes are disappointed in their expectation from their use. There are some other intentions for which milk courses are directed besides that of a restorative; for they are gone into frequently as correctors and sweetners, but they are not to be trusted to in such cases, although they certainly are good helps together with more effectual means.

Dr. Cheyne recommends a milk and seed-diet with water for drink, as the surest preservative against diseases, and cure of them. See GOUT, PALSY, &c.

Disorders from MILK. The milk is often very troublesome and dangerous to women in their lying-in, and subjects them to many painful disorders. The milk fever happens on the third or fourth day from delivery, and arises from a congestion of milk in the breasts, which frequently extend to the arm-pits, where the pain is sometimes violent. This fever generally continues a day or two, and ends spontaneously, by the benefit of nature, in copious sweats, which are proportionable to the cold fits or preceding rigours. There may sometimes be occasion for hot diluents and gentle diaphoretics: the patient should use a slender diet, and put the child often to the breast; but if she does not design to give suck, a slender diet, testaceous powders, and diaphoretics will be more necessary; and the breast should be drawn by some proper person. If the flux of the lochia be too sparing, it should be promoted. If the pain is great, the lochia commonly stop; but flow again when it ceases. To prevent the inspissation of the milk, the breasts may be embrocated with warm linseed-oil, or oil of sweet almonds, or the leaves of red cabbage may be laid thereto. If the fever is very acute and hot, and an inflammation of the breasts is feared, it will be proper to bleed. Women commonly put double cloths dipt in brandy under the arm-pits, to drive back the milk. See the article INFLAMMATORY FEVERS.

A too great thinness of the milk is a common

common complaint with nurſes: this is to be laid ſometimes to the diet, ſometimes to the concoction, and ſometimes to the unnatural tenuity of the humours. In this caſe the milk is ſometimes perfectly watry, and the child is thrown into an atrophy by it. The remedies for this are a change of diet, and a purging of the primæ viæ, by ſome gentle cathartic, and afterwards a ſtrengthening of them, by bitters and ſtomachic medicines: ſometimes it is alſo neceſſary to evacuate the ſerous humours, by the common phlegmagogues, ſuch as jalap in proper doſes, with a little powdered ginger, which is an excellent corrective for it.

The milk is ſometimes ſalt to the taſte, and ſometimes of a bilious yellow colour, and theſe diſtemperatures of it uſually throw the child into colics, diarrhœas, vomitings, cutaneous eruptions with ſcabs, ſometimes abſolute ulcerations, and ſometimes into fevers. In this caſe the nurſe is to take the abſorbents and nitrous medicines with intermediate purges; but during the courſe of taking theſe remedies, and for ſome time afterwards, the diet muſt be under ſome regulations, particularly ſalt foods are to be avoided, and all acids, aromatics, and ſtrong liquors either wholly let alone, or taken very ſparingly: the perſon muſt carefully avoid all violent paſſions of the mind, as anger, fear, and the like, and abſtain from all violent emotions of the body.

A contrary extreme to the thinneſs and watry appearance of the milk is a mucous thickneſs of it: this is principally troubleſome and dangerous to the parent, as it is apt to bring on tumours and nodes of the breaſt. The method of treatment in this caſe is to give gentle alexipharmics for ſome days: then the gentle laxative medicines in ſmall doſes, and finally allow a moderate uſe of wine.

Deficiency of milk is alſo a very common complaint, and it is in ſome caſes abſolute; there being no milk at all derived into the breaſts: in others, it is only a partial one; there being ſome milk, though not enough to ſupply the child with nouriſhment. A total deficiency of milk moſt frequently happens to thoſe who have their firſt child when ſomewhat advanced in years, and to ſuch as are of a choleric diſpoſition; but a partial deficiency of it is often owing to a ſaltneſs of the ſerum, and ſometimes to the want of nouriſhments, and often is brought on by ſorrow. When ſaline and bilious humours are in fault, then lac lunæ, calcined cryſtal, and other abſorbent powders become of great uſe: ſome alſo preſcribe the powders of earth-worms carefully dried, and the voiding the humours by ſtool, by means of gentle purges: when the want of nouriſhment is the only occaſion of it, the milk may always be recovered in a proper quantity, by means of good foods with milk and other nouriſhing fluids.

An over-abundance of milk is as common a complaint as a deficiency of it, and requires as much care in the treatment of it, otherwiſe the perſon is frequently ſubject to nodes and abſceſſes in the breaſt: the proper remedies are the eating and drinking more ſparingly, and letting two children ſuck inſtead of one, together with thoſe methods already preſcribed in the milk-fever.

MILK *of Sulphur*. See SULPHUR.

MILL, a machine or engine for grinding corn, &c. of which there are ſeveral kinds, according to the various methods of applying the moving power; as water-mills, wind-mills, mills worked by horſes, &c.

In water-mills the momentum of the water is the moving power, and the attrition of the two ſtones in grinding, is the force to be overcome. Of theſe there are two kinds, *viz.* thoſe where the force of the water is applied above the wheel, and thoſe where it is applied below the wheel; the former being called over-ſhot, and the latter under-ſhot mills: and to theſe we may add a breaſt-mill, where the water ſtrikes againſt the middle of the wheel.

Some may imagine, that it is hardly worth while to write about ſo common a thing as a corn-mill; but the commonneſs of it ſhews its uſefulneſs, and therefore it would be unpardonable in us to paſs it over in ſilence.

Few people are ignorant, that corn is ground by two mill-ſtones, placed one above the other, without touching. The lower or nether mill-ſtone is immoveable, but the upper one turns upon a ſpindle. The oppoſite ſurfaces of the two ſtones, which act to grind the corn, are not plane or flat; but the upper one is hollow, and the under one ſwells up; each of them being of a conic figure, whoſe axis indeed is very ſhort in proportion

portion to the diameter of its bafe: for the upper one, being fix feet in diameter, is hollowed but about one inch at its center; and the lower one rifes but about ¾ of an inch. Thefe two mill-ftones come nearer and nearer towards their circumference, whereby the corn that falls from the hopper has room to infinuate between them as far as ⅔ of the radius, which is the place where it begins to be ground, and where it makes the greateft refiftance that it is capable of; the fpace between the ftones being in that place about but ⅔ or ¾ of the thicknefs of a grain of corn. But as the millers have the liberty of raifing or finking the upper ftone a little, they can proportion its diftance from the lower one, according as they would have the flour finer or coarfer.

The circular motion of the upper mill-ftone brings the corn out of the hopper by jerks, and caufes it to recede from the center towards the circumference, where being quite reduced to flour, it is thrown out of the mill, by the centrifugal force of the ftone, through a hole provided on purpofe.

As the water acts upon an over-fhot mill both by impulfe and weight, fo does it likewife upon a breaft-mill, or that where the water comes upon the breaft or middle-part of the wheel: and here, though the weight of the water is not fo great as in the overfhot mill, being contained in the buckets of the lower quarter only; yet the impulfe of the water is much greater, the height of the water being increafed nearly the femi-diameter of the great wheel, all other things being equal. If the height of the water remain the fame, the aperture of the penftock muft be enlarged to nearly twice the area, that the force may be the fame; fo that to produce the fame effect, twice as much water is neceffary for a breaft-mill as for an over-fhot one, every thing elfe being the fame.

As to the underfhot-mill, it is evident there can be only the impulfe from the water; and therefore, the height of the water remaining the fame, there muft be a larger aperture of the penftock for the difcharge of a greater quantity of water in the fame time, in order to produce the fame effect as in the overfhot or breaft-mill: whence a greater expence of water will be made here than in any other mill, and can only be fupplied for a conftancy by a river; and where this can be had, the underfhot is the eafieft, cheapeft, and moft fimple ftructure a mill is capable of.

The diameter of common mill-ftones, according to Dr. Defaguliers, is from five to feven feet, and their thicknefs, twelve, fifteen, or eighteen inches: they laft thirty-five or forty years; and when they have been long ufed, fo that their thicknefs is confiderably diminifhed, they are cut anew.

Here follows the defcription of an underfhot-mill, taken from Belidor's architecture hydraulique. A B (plate CLXXVI. n° 1.) is the underfhot-wheel, upon whofe fhaft D is fixed a fpur or cog-wheel E, whofe cogs take the rounds of the trundle or lantern G, which carries round the mill-ftone in the hurft or round frame I, containing the lower mill-ftone at N N, and the upper one at V V; the axis, or fpindle, fixed to the upper mill-ftone being the iron-bar F H. They commonly make thefe fort of underfhot-wheels from twelve to eighteen feet in diameter, the float-boards about two and a half or three feet long, and ten or twelve inches deep. The fhaft is fifteen or eighteen inches in diameter; the cog-wheel, eight feet in diameter: it has forty-eight cogs four inches high, and three inches and a half wide. The lantern or trundle is made of two round pieces, or flat-heads, twenty-two inches in diameter, and four inches thick, in which are fet nine rounds of two inches and a half diameter, and eighteen inches high. Through the trundle goes an iron axis, two inches and a half fquare, and of a height proportionable to the fituation of the mill-ftones: it muft be well faftened to the upper mill-ftone, and its lower end being reduced to a pivot, turns in a focket let into the fupporting piece H. The fection of a mill-hopper and drum that covers the mill-ftones, is reprefented *ibid.* n° 2. The hopper is a fmall trough A, with a fpout B, to convey the corn out of the hopper into the aperture of the upper mill-ftone, D D. The iron-bar which paffes through the trundle, is marked C, and the under mill-ftone E E, the interval or fpace between the ftones being reprefented by the dark crooked line F F.

To this account of an underfhot-mill, we fhall add that of an over-fhot one; wherein A B (*ibid.* n° 3.) is the axle-tree or fhaft of the water-wheel, which has fix arms C, C, *&c.* fixed in it at D. The

sole of the wheel, marked E E E, is fixed, and contains thirty buckets, about eighteen inches broad, and fourteen inches deep; the elbow to the sole, G H, being four inches. L, a cog-wheel placed on the same shaft by four arms at M, has forty-eight cogs, which turn the wallower, pinion, or trundle N, with nine rounds or leaves; and in this trundle is fixed an iron-spindle N Q, going through the middle of the lower mill-stone P, and turning the upper one R, by means of the rind Q.

I is another wallower or trundle, which is applied at pleasure to the cog-wheel L; and on the same axis is another cog-wheel K, having forty cogs, which turn S a wallower of nine rounds; whose axis T has a rind V at its top, whereby it bears and turns the upper mill-stone W. YZ is a trough or lander, which conveys the water from the pool or dam to the buckets of the wheel at Z. This has a penstock *ab*, and an orifice *cd*, with a shuttle or sluice to open or shut it; and is generally raised about two inches above the wheel, by means of a lever *e*, fixed to the shank by the handle *f*. The surface of the water in the pool must be considerably higher than the level of the top of the wheel.

Dr. Barker's new invented mill (*ibid.* n° 4.) is of the most simple structure of any yet made, performing its effect without any wheel, trundle, cog, or round; the manner of whose operation may be easily understood from the following account of its several parts. A B C D is an upright frame, standing on a proper base; E F is the wider part of G H, an upright hollow pipe or tube, fixed at the bottom to an horizontal square trunk I K; which trunk, together with the tube, is fixed to an upright spindle or axis R S, by means of a nut and screw at S. The lower end of the axis moves on a fine point in the pivot-hole, in the part of the frame at T. On the upper part of the frame is a hole through which the spindle passes, as also through the round circular piece P, fixed on the said frame. On the upper part of the spindle is fixed another round piece O, which represents the upper mill-stone. Q is a spout of water filling the tube or trunk, and giving motion thereto; and consequently to the axis and upper stone: by the horizontal jets of water from each end to the trunk I K, through holes made at each end on contrary sides. While the holes continue stopped, the trunk will be at rest, because then the pressure is equal over all the parts; but when the holes are open, the pressure of the water (by its having liberty to issue out) will be less on that part where the hole is, than on the other part opposite to it; which stronger pressure will prevail, and carry round the trunk and tube with the axle and stone, in a contrary direction; and each hole contributes to produce this motion, which will be greater or lesser in proportion to the momenta of the jets of water, or greater or lesser aperture of the holes.

For it is easy to understand, that the power of this machine is derived from, or depends upon, three things: 1. The velocity of the spouting-water. 2. The quantity thereof. And, 3. The distance at which the water spouts from the axis of motion. The two first make the momentum arising from the pressure of the fluid, which is proportional to the altitude or height of the tube; the last is of a mechanical nature, for the trunk is, in this respect, exactly of the nature of the lever.

When the quantity of water is not sufficient to turn an undershot-wheel, and there is not height enough for an overshot-one, the water is made to fall into the buckets of a breast-wheel, as it is called, (see plate CLXXVII. fig. 1.) about the height of the center of the shaft, and to work by its weight till it gets to the bottom, thro' the channel T G D.

The late ingenious Dr. Barker contrived one of these, which, notwithstanding the disadvantage already hinted, fell little short of an overshot-one. The wheel A A A is nineteen feet in diameter, with twelve arms and twenty-four ladle-boards, which receive the water a little above the horizontal diameter of the wheel, at T, and do not part with it till they come to the lowest part of the wheel. To effect this, there is a circular channel G G H, the section of which *g g* G G, (*ibid.* fig. 2.) made by a plane passing through the wheel's center, is every where eighteen inches square: the ladle-boards, F F, (*ibid.*) nearly fill this channel, so as to just pass down without touching it. D *d* is the supporter of the ladle-board, with a hole near *d* to drive a key or wedge on the inside of the sole of the wheel, *a a a a*, to hold fast this piece together with the ladle-board.

Of all the water-mills that have hitherto been

been thought of, there are none more ingenious or ſimple than thoſe which have been invented at Toulouſe in Languedoc; the deſcription of which, taken from Belidor, is as follows.

There are ſixteen mills a-breaſt which go continually, and which ſerve both the city and county around it with flour: but as they are all equally acted upon by the current, and are independent of one another, we ſhall only deſcribe three of them.

Plate CLXXVIII. fig. 1. ſhews the plan of ſeveral pieces of maſon work that ſerve as piers to ſeveral arches which ſhut with ſluices, and are repreſented in fig. 4. which is an elevation took upon the length A B. Every ſluice anſwers to a channel 7, faced with maſon-work, and which grows narrower continually till it comes to C D, where it terminates at a cylindrical veſſel C E D without any bottom, which is likewiſe of ſtone-work: the water which is confined behind the ſluice 5, and paſſing through the hole 22, enters with great velocity into the channel, and not finding ſo large a paſſage to run out by as that by which it entered, it ſwells and falls with the greater force into the cylinder, forming a whirlpool, and turns a horizontal wheel at the bottom of it, which is repreſented at F. The axle I of this wheel terminates at the mill-ſtone K, fig. 2. The water, when it has run round ſeveral times in the cylinder, and ſtruck the ladles of the wheel, runs out again by the openings left betwixt theſe ladles at the bottom of the cylinder, and goes off on the underſide by a ſlope. This may ſerve to give a general idea of the conſtruction of theſe mills, which we ſhall now deſcribe more particularly.

The wheel has a pivot which is fixed in the ſocket made in the reſting place N, (fig. 2.). This reſting place is ſupported at V by a threſhold into which it is morticed; the extremity of it, X, is fixed by an iron-pin to the beam O, ſuſpended by the lever P Q, (fig. 2.) ſupported at one end P, and ſuſpended at the other to the beam Q R, pierced at the top with ſeveral holes to receive an iron-pin: and as all the different pieces move together, when the extremity R is lifted up or let down, the wheel F may be raiſed or lowered on purpoſe to bring the upper mill-ſtone K near to the under one, as is uſual in common mills.

The height of the cylinder is expreſſed by L M, and you may ſee, on the ſide where the water runs off, the maſon-work of which it is compoſed, and which is ſupported by theſe beams M and T. There is in this part an arch S behind each cylinder, which cannot be well diſtinguiſhed but in fig. 3. which is an elevation of the mill upon the line Q R, where you may diſtinguiſh the different parts on the inſide from the place where the water enters to where it runs out. And to know them you have only to ſeek for the different figures and letters of the ſeveral plates, which ſhow the relation of the parts to one another, in the different points of view. The maſonry of the cylinders is founded upon carpenter's work: for as the water paſſes underneath, it was neceſſary to build them in the air, and to ſupport them on the piers Y, *y*.

Theſe mills are ſo diſpoſed, that all the parts belonging to one, may be taken to pieces without hindering the going of any of the reſt, when there is any repairs to be made, as every one has its own channel, which needs only to ſhut to be at liberty of working both above and below.

As there is only five feet four inches (almoſt ſix feet Engliſh) from the center of one mill-ſtone to another, you may build twelve mills upon a river of ten or twelve fathoms in breadth, whereas uſually they only make four, and moreover they are obliged to build on both ſides: in this kind, as there is neither cog-wheel nor trundle-head, nor any friction beſides that of the pivot of the wheel, they ſeldom want repairs. The wheel is three feet in diameter and is made of one piece of the body of a tree, and the ladles are cut out on it, which are inclined on its thickneſs, and made ſomewhat bending, as you may ſee on the figure.

There might be ſeveral curious enquiries made for the improving this wheel; we ſhall only mention, that the water which turns it moves it with a force compounded of its weight and the circular direction which it receives from the cylinder: the bending of the ladles ought to be circular, and the inclination which they have from top to bottom, ought to make an angle of 54° 44′ with the axle of the wheel, ſince it is the ſame caſe as the ſails of a wind-mill.

Hand MILL, or *horſe* MILL, that worked by the hand, or by horſes, &c. A (plate CLXXVII. fig. 3.) the long beam or lever

MILLS with Horizontal Water-Wheels

Fig. 1. A Plan of their Mason-Work, &c.

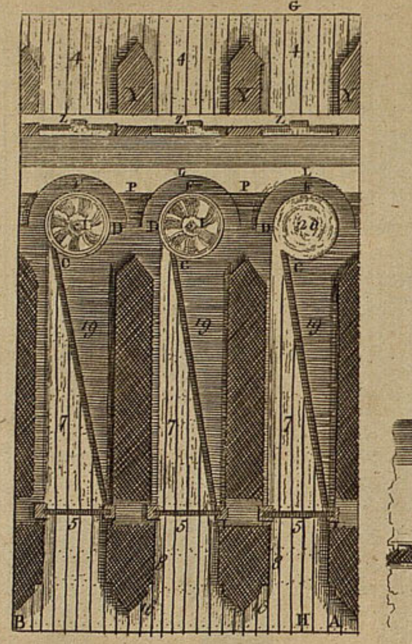
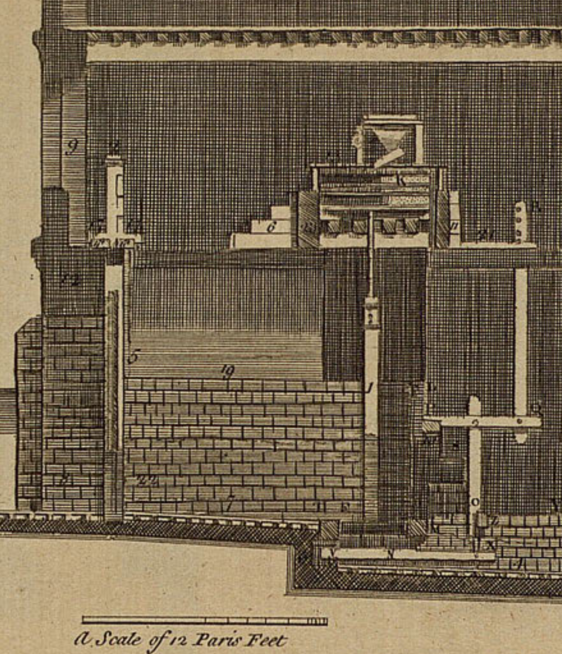


Fig. 2. A Section taken on the Line GH.



A Scale of 12 Paris Feet

Fig. 3. A Profile and Elevation taken on the Line QR.

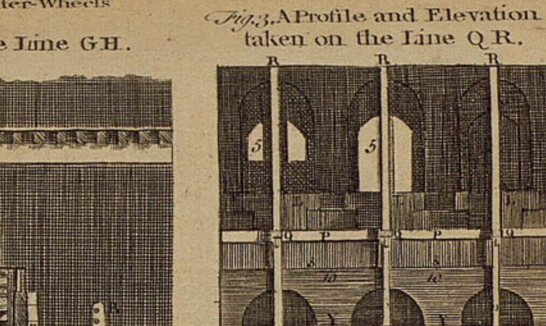


Fig. 4. An Elevation taken on the Line AB.

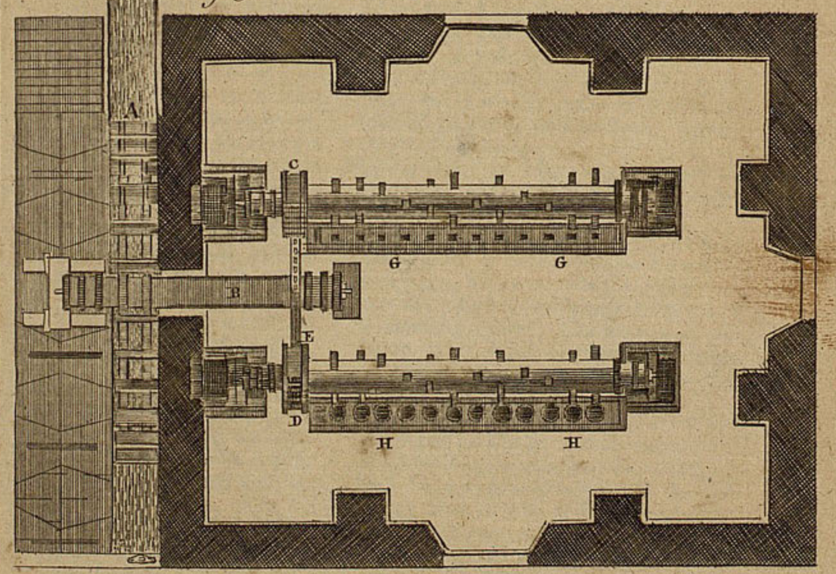


T. Jefferys sculp.

Fig. 1. An Elevation of A Powder-Mill.

Fig. 2. A Profile, &c.

Fig. 3. Plan of A Powder-Mill.



J. Jefferys sculp

lever for moving it, may be double, triple, or quadruple, so as to receive several men or horses, to drive several mills at once. B is the cog wheel, placed horizontally, with pins fixed, not on its plane, but on the outside, at the circumference of the joints. The trundle-head is marked C, the support D, the iron-axis E, and the drum where the mill-stones are inclosed F.

MILL is also used for any machine, which being moved by some external force, makes a strong impression on things applied thereto: such are fulling-mills, paper-mills, mills used in coining, gun-powder-mills, oil-mills, stamping-mills, sugar-mills, &c. See FULLING, PAPER, COINING, &c.

Cyder-MILL. The cyder-mill (*ibid.* fig. 2.) consists of a large round trough, A; into which the apples are thrown, and there reduced to a pulp, by means of the wooden wheel, B, whose axis, D, is fastened to a turning beam, C, and turned round by a horse. When the apples are thus reduced to pulp, they are put into the cyder-press. See the article PRESS.

Gun-powder MILL, is that used for pounding and beating together the ingredients whereof gun-powder is composed. See the article GUN-POWDER.

These ingredients being duly proportioned and put into the mortars of the mill, which are hollow pieces of wood, each capable of holding twenty pounds of paste, are incorporated by means of the pestles and sprinkling. There are twenty-four mortars in each mill, where are made each day 480 pounds of gun-powder; care being taken to sprinkle the ingredients in the mortars with water, from time to time, lest they should take fire. The pestle is a piece of wood ten feet high and 4 ½ inches broad, armed at bottom with a round piece of metal. It weighs about sixty pounds.

But the operation of this mill will be better conceived from an inspection of its several parts. Plate CLXXIX. fig. 1. represents the plan of the water wheel and trundle-heads; where A is the wheel, B its arbor; C, D, the two trundle-heads, each turning with their proper arbor; E the cog-wheel driven by the arbors of the great wheel, and inserting its teeth between the spindles of the trundle-heads, makes one of them turn one way and the other another way.

Fig. 2. *ibid.* is the profile of the great wheel and cog-wheel, marked A and E; where B B is the arbor of the great wheel, C the arbor of the trundle-head C, F F the pestles, and H H the outsides of the mortars,

Fig. 3. *ibid.* is a plan of the whole machine; A being the great wheel; B its arbor; C, D, the trundle-heads, each with its proper arbor, called here canting-wheel; being each environed with twelve small pieces of wood, called lifts, jutting out to raise the pestles. E is the cog-wheel; G G the tails of the pestles, and H H the bottoms of the mortars.

If water be given to the great wheel, the cog-wheel must likewise move and drive contrary ways the two trundle-heads and their canting-wheels; and each lift, turning with the canting-wheels, meets with the stay of a pestle, and lets it fall into its mortar. These twelve lifts are disposed in such a manner, that there is always four of them up, and four pestles unequally ready to fall, so that only one of them falls at a time; and on this disposition of the pestles depends the equality of the trituration, which succeeds still better, by making the paste pass thro' the several mortars at regular times.

MILL *for iron-work.* See SMITHERY.

Sawing MILL. See the article SAWING.

Sugar-MILL. See the article SUGAR.

Tanning-MILL. See TANNING-MILL.

MILL-POOL, a stock or pond of water, by the force of which the motion of a water-mill is effected.

The dam of a mill pool is raised much in the same manner as directed for fish-ponds. See the article FISH-POND.

MILL-STONE, that used in mills, for grinding; being usually made of several species of psaduria, or free stone. See the article PSADURIA.

MILLAND, or MILHAND, a town of Guienne in France, sixty miles north-west Montpelier.

MILLENARIANS, or CHILIASTS, a name given to those, who, in the primitive ages, believed that the saints will one day reign on earth with Jesus Christ a thousand years. The former appellation is of latin original, the latter of Greek, and both of the same import.

The millenarians held, that after the coming of antichrist, and the destruction of all nations, which shall follow, there shall be a first resurrection of the just alone: that all who shall be found upon earth, both good and bad, shall continue alive; the good, to obey the just who are

 risen,

rifen, as their princes; the bad, to be conquered by the juft, and to be fubject to them: that Jefus Chrift will then defcend from heaven in his glory: that the city of Jerufalem will be rebuilt, enlarged, embellifhed, and its gates ftand open night and day. They applied to this new Jerufalem, what is faid in the Apocalypfe, ch. xxi. and to the temple, all that is written in Ezekiel xxxvi. Here, they pretended Jefus Chrift will fix the feat of his empire, and reign a thoufand years with the faints, patriarchs and prophets, who will enjoy perfect and uninterrupted felicity.

This reign of our Saviour on earth is ufually ftyled the millenium, or reign of a thoufand years.

MILLEPES, the common WOOD-LOUSE, a fpecies of the onifcus with a blunt forked tail. See the article ONISCUS.

Its body is fhort and broad, approaching to an oval figure; it grows to near half an inch in length, and about half its length in diameter; its back is fomewhat rounded, the belly flat; the colour a bluifh grey; and the legs are feven or eight on each fide, but the more ufual number is feven. It runs nimbly, and on being touched rolls itfelf up to a kind of ball. It is common about old trees, and under logs of wood and ftones.

The beft way of taking thefe animals, is fwallowing them alive; for as they roll themfelves into a kind of pill, they eafily flip down the throat untalted, and are immediately deftroyed on falling into the ftomach: this is the fureft way of having all their virtues; the next to this is bruifing them in wine, and taking the expreffion. They are fometimes dried, and given in powder, but in this ftate they lofe the greater part of their virtues; however, if the patient can be prevailed on to take them no other way, the beft method of preparing them, is that ordered in the New London Difpenfatory, which is the tying them up in a thin canvas-cloth, and fufpending them within a covered veffel, over the fteam of hot fpirit of wine; they are foon killed by this vapour, and rendered friable.

Millipedes are aperient, attenuant, and detergent; they diffolve vifcous humours, are good in all obftructions of the vifcera, and have even been celebrated by fome writers as a remedy for the ftone, which it is pretended they have a power of reducing to a mucilage, and carrying off. They are often found to be of fervice in afthmas, and gaeat good has been fometime done by a long courfe of them in diforders of the eyes.

MILLERIA, a genus of the fyngenefia-polygamia clafs of plants, the compound flower of which is radiated; there is fcarce any vifible receptacle of the feeds, which are fingle after each particular flower, and have no pappus or down.

MILLET, *milium*, in botany, a genus of the triandria digynia clafs of plants, the calyx of which is a bivalve glume; the corolla is bivalve, fhorter than the cup, and grows to the feed, which is fingle and roundifh.

Millet-feed is accounted refrigerant and drying, and recommended in fluxes: it is alfo faid to promote fweat and urine very powerfully.

MILLING, in the manufacture of cloth, the fame with fulling. See FULLING.

Milling of filk, is an operation otherwife called throwing.

MILLION, in arithmetic, the number of ten hundred thoufand, or a thoufand times a thoufand. See the article NUMBER and NUMERATION.

MILLREE, a Portuguefe gold-coin. See the article COIN.

MILO, or MELO, one of the iflands of the Archipelago, fixty miles north of Candia.

MILT, in anatomy, a name fometimes given to the fpleen. See SPLEEN.

MILT, or MELT, is alfo a denomination by which fome call the rows of fifhes.

MILTENBERG, a town of Germany, eighteen miles fouth of Afchaffenberg.

MILTON, the name of feveral market-towns, as one twelve miles north-eaft of Dorchefter, and another twelve miles north-eaft of Maidftone.

MILVUS, the KITE, in ornithology, a fpecies of falcon, with a forked tail, a yellow cera, a brown body, and a whitifh head. It is a very common bird with us, about the fize of a large tame pigeon. See the artícle FALCON and KITE.

MILVUS, in ichthyology, the fame with the hirundo pifcis, or fwallow-fifh. See the article HIRUNDO.

MIME, μῖμος, in the antient comedy, a perfon who acted any character by mere geftures, and hence denominated pantomime. See the article PANTOMIME.

MIMESIS, μίμησις, in rhetoric, the imitating the voice and geftures of another perfon.

MIMOSA, the SENSITIVE PLANT, in botany. See the article SENSITIVE.

MIMULUS, in botany, a genus of the didynamia-angiofpermia clafs of plants, with double ftigmata, and a ringent monopetalous flower; the fruit is a bilocular capfule, with feveral feeds in each cell.

MIMUSOPS, in botany, a genus of the octandria-monogynia clafs of plants, the corolla of which confifts of eight petals; and its fruit is a drupe.

MINA, in grecian antiquity, a money of account, equal to an hundred drachms. See MONEY and DRACHM.

MINCIO, or MENZO, a river of Italy, which, after running through the dutchy of Mantua, difcharges itfelf into the Po, at Borgoforte.

MIND, *mens*, νυς, a thinking intelligent being, otherwife called fpirit, in oppofition to matter or body. See the articles BODY and SPIRIT.

The culture of the human mind is more immediately taught in the fciences of logics and ethics. See LOGIC and ETHICS. When the mind, fays Mr. Locke, turns its view inwards upon itfelf, thinking is the firft idea that occurs; wherein it obferves a great variety of modifications, whence it frames to itfelf diftinct ideas. See IDEA. Thus the preception annexed to any impreffion on the body by an external object, is called fenfation; when an idea recurs without the prefence of the object, it is called remembrance; when fought after by the mind, and brought again into view, it is recollection; when the ideas are taken notice of, and as it were regiftered in the memory, it is attention; when the mind fixes its view on any one idea, and confiders it on all fides, it is called ftudy.

MINDANAO, the largeft of the Philippine iflands, except Luconia, is fituated between 120° and 126° eaft longitude, and between 5° and 10° north lat.

MINDELHEIM, a city of Germany, thirty-three miles fouth eaft of Ulm. It is the capital of the principality of Mindelheim, conferred on the duke of Marlborough, by the emperor in 1704.

MINDEN, a city of Germany, the capital of a dutchy of the fame name, fituated forty miles weft of Hanover.

MINDORA, one of the Philippine iflands, lies fouth-weft of Luconia, from which it is fituated by a narrow channel.

MINE, in natural hiftory, a place under ground, where metals, minerals, or even precious ftones are dug up. See the article DIGGING.

As, therefore, the matter dug out of mines is various, the mines themfelves acquire various denominations, as gold-mines, filver-mines, copper-mines, iron-mines, diamond-mines, falt-mines, mines of antimony, of alum, &c. See the articles GOLD, SILVER, &c.

Mines, then, in general, are veins or cavities within the earth, whofe fides receding from, or approaching nearer to, each other, make them of unequal breadths in different places, fometimes forming larger fpaces, which are called holes: they are filled with fubftances, which, whether metallic or of any other nature, are called the loads; when the fubftances forming thefe loads, are reducible to metal, the loads are by the miners faid be alive; otherwife they are called dead loads. In Cornwal and Devon, the loads always hold their courfe from eaftward to weftward; though in other parts of England, they frequently run from north to fouth. The miners report, that the fides of the load never bear in a perpendicular, but conftantly under-lay, either to the north or to the fouth. The load is frequently intercepted by the croffing of a vein of earth, or ftone, or fome different metallic fubftance; in which cafe it generally happens that one part of the load is moved a confiderable diftance to the one fide. This tranfient load is by the miners called flooking: and the part of the load which is to be moved, is faid to be heaved. See the article FLOOKING.

According to Dr. Nichols's obfervations upon mines, they feem to be, or to have been, the channels through which the waters pafs within the earth, and, like rivers, have their fmall branches opening into them, in all directions. Moft mines have ftreams of water running through them; and when they are found dry, it feems to be owing to the waters having changed their courfe, as being obliged to it, either becaufe the load has ftopped up the antient paffages, or that fome new and more eafy ones are made.

Mines, fays Dr. Shaw, are liable to many contingencies; being fometimes poor, fometimes foon exhauftible, fometimes fubject to be drowned, efpecially when deep, and fometimes hard to trace; yet there are many inftances of mines proving highly advantageous for hundreds of years: the mines of Potofi are to this day worked with nearly the fame fuccefs as at firft; the gold-mines of Cremnitz have been worked almoft thefe thoufand years; and our cornifh tin-mines are extremely antient.

antient. The neat profit of the ſilver alone, dug in the miſnian ſilver-mines in Saxony, is ſtill, in the ſpace of eight years, computed at a thouſand ſix hundred and forty four millions, beſides ſeventy-three tons of gold. Many mines have been diſcovered by accident: a torrent firſt laid open a rich vein of the ſilver-mine at Friberg in Germany; ſometimes a violent wind, by blowing up trees, or overturning the parts of rocks, has diſcovered a mine; the ſame has happened by violent ſhowers, earthquakes, thunder, the firing of woods, or even the ſtroke of a plough-ſhare, or horſe's hoof.

But the art of mining does not wait for theſe favourable accidents, but directly goes upon the ſearch and diſcovery of ſuch mineral veins, ores, or ſands, as may be worth the working for metal. The principal inveſtigation and diſcovery of mines depend upon a particular ſagacity, or acquired habit of judging from particular ſigns, that metallic matters are contained in certain parts of the earth, not far below its ſurface. The principal ſigns of a latent metallic vein, ſeems reducible to general heads, ſuch as, 1. The diſcovery of certain mineral waters. 2. The diſcolouration of the trees or graſs of a place. 3. The finding of pieces of ore on the ſurface of the ground. 4. The riſe of warm exhalations. 5. The finding of metallic ſands, and the like. All which are ſo many encouragements for making a ſtricter ſearch near the places where any thing of this kind appears; whence rules of practice might be formed for reducing this art to a greater certainty. But when no evident marks of a mine appears, the ſkilful mineraliſt uſually bores into the earth, in ſuch places as from ſome analogy of knowledge, gained by experience, or by obſerving the ſituation, courſe, or nature of other mines, he judges may contain metal: this method of boring we have already given under the article BORING.

After the mine is found the next thing to be conſidered, is whether it may be dug to advantage. In order to determine this, we are duly to weigh the nature of the place, and its ſituation, as to wood, water, carriage, healthineſs, and the like, and compare the reſult with the richneſs of the ore, the charge of digging, ſtamping, waſhing, and ſmelting. See STAMPING, WASHING, and SMELTING. Particularly the form and ſituation of the ſpot ſhould be well conſidered. A mine muſt either happen, 1. In a mountain. 2. In a hill. 3. In a valley. Or, 4. in a flat. But mountains and hills are dug with much greater eaſe and convenience, chiefly becauſe the drains and burrows, that is the adits or avenues may be here readily cut, both to drain the water and to form gang-ways for bringing out the lead, &c. In all the four caſes we are to look out for the veins which the rains, or other accidental thing, may have laid bare; and if ſuch a vein be found, it may often be proper to open the mine at that place, eſpecially if the vein prove tolerably large and rich: otherwiſe the moſt commodious place for ſituation is to be choſe for the purpoſe, *viz.* neither on a flat, nor on the tops of mountains, but on the ſides. The beſt ſituation for a mine, is a mountainous, woody, wholſome ſpot; of a ſafe eaſy aſcent, and bordering on a navigable river. The places abounding with mines are generally healthy, as ſtanding high, and every where expoſed to the air; yet ſome places, where mines are found, prove poiſonous, and can, upon no account, be dug, though ever ſo rich: the way of examining a ſuſpected place of this kind, is to make experiments upon brutes, by expoſing them to the effluvia or exhalations to find the effects.

For the different veins, and the manner of tracing them, ſee the articles VEIN, and METALS.

Devonſhire and Cornwal, where there are a great many mines of copper and tin, is a very mountainous country, which gives an opportunity in many places to make adits, or ſubterraneous drains, to ſome valley at a diſtance, by which to carry off the water from the mine, which otherwiſe would drown them out from getting the ore. Theſe adits are ſometimes carried a mile or two, and dug at a vaſt expence, as from 2 to 4000 l. eſpecially where the ground is rocky; and yet they find this cheaper than to draw up the water out of the mine quite to the top, when the water runs in plenty, and the mine is deep. Sometimes, indeed, they cannot find a level near enough, to which an adit may be carried from the very bottom of the mine; yet they find it worth while to make an adit at half the height to which the water is to be raiſed, thereby ſaving half the expence; where being delivered into the trough L Z (pl. CLXXX. fig.

fig. 1.) it runs off under ground, without being drawn up to the mouth of the mine.

The late Mr. Coftar, confidering that fometimes from fmall ftreams, and fometimes from little fprings, or collections of rain-water, one might have a pretty deal of water above ground, though not a fufficient quantity to turn an overfhot-wheel, thought that if a fufficient fall might be had, this collection of water might be made ufeful in raifing the water in a mine to the adit, where it may be carried off. The fall to be had, appeared to him to be C L (*ibid.*) the height of the mouth of the mine down to the adit, which we fhall here fuppofe twenty-five yards. Then he contrived to place a rag-wheel R R, with its chain or bucket-pump, at the mouth of the mine C *c*, as reprefented in the figure; receiving the water, collected in the ciftern W, thro' the pipe A, conveying it into the buckets B, making them go the reverfe way (becaufe in the common chain-pump, the rag wheel carries the buckets, but here the buckets carry the rag-wheel) down as far as the adit, into which they difcharge themfelves at *b b*; where turning another rag-wheel *r r*, whofe axis works an engine that brings the water from the bottom, and delivers it into the adit L Z, which carries away both the waters to the opening at the bottom of the mountain, which we fuppofe at a great diftance from the mine.

Any kind of engine may be worked by this lower rag-wheel, whofe axis is H I (*ibid.*) as, for example, a common chain pump, by making the rag-wheel fufficiently deep; or cranks, as reprefented at Gg, working two pump-rods K, K, moving in the barrels M, M, and delivering their water into the trough L Z, leading to the adit.

N. B. There muft be a wheel fixed to the axis of the upper rag-wheel at C, to carry a pinion or fmaller wheel D, having a fly E F; in order to regulate the motion of the whole machine, and prevent jerks.

One confiderable advantage may be reaped from a great fall of a fmall quantity of water, by fixing Dr. Barker's breaft-wheel a little above the adit-ciftern under ground. Let plate CLXXVII. fig. 1. be inverted, as at n° 3. *ibid.* and P P *p p* reprefents the bottom of a fquare perpendicular trough, that conveys the water to the mouth of the circular channel G G, where the ladle-boards run in the direction 3, 4, 5, and quit the water at 6. A chain C *o*, pulling the fhuttle M *n*, lets down the water upon the ladle-boards, in proportion to its quantity. The axis of this wheel, in going round, may be made to move any kind of water-work, to bring up the water from the bottom of a mine into the adit, there to be carried off.

MINE, in the military art, denotes a fubterraneous canal, or paffage, dug under the wall or rampart of a fortification, intended to be blown up by gun-powder.

The alley or paffage of a mine is commonly about four feet fquare; at the end of this is the chamber of the mine, which is a cavity about five feet in width and in length, and about fix feet in height; and here the gun-powder is ftowed. The faucifle of the mine, is the train, for which there is always a little aperture left. There are various kinds of mines, which acquire various names, as royal mines, ferpentine-mines, forked-mines, according as their paffages are ftraight, oblique, winding, &c. There are alfo mines made in the field, which are called fougades. See the article FOUGADE.

Mines are either dug within the body of the earth, as thofe made by the befieged to blow up the works of the befiegers, before they make a lodgment on the covered way; or in eminences and rifing grounds, as to make a breach in the ramparts, &c. or to blow up walls, or laftly, to tear up rocks.

Two ounces of powder have been found, by experiment, capable of raifing two cubic feet of earth; confequently two hundred ounces, that is twelve pounds eight ounces, will raife two hundred cubic feet, which is only fixteen feet fhort of a cubic toife, becaufe two hundred ounces joined together, have proportionably a greater force than two ounces, as being an united force. See the article GUN-POWDER.

All the turnings a miner ufes to carry on his mines, and through which he conducts the faucifle, fhould be well filled with earth and dung; and the mafonry in proportion to the earth to be blown up, as 3 to 2. The entrance of the chamber of the mine ought to be firmly fhut with thick planks, in the form of a St. Andrew's crofs, fo that the enclofure be fecure, and the void fpaces fhut up with dung, or tempered earth. If a gallery be made below, or on the fide of the chamber,

chamber, it muſt abſolutely be filled up with the ſtrongeſt maſonry, half as long again as the height of the earth; for this gallery will not only burſt, but likewiſe obſtruct the effect of the mine. The powder ſhould always be kept in ſacks, which are opened when the mine is charged, and ſome of the powder ſtrewed about: the greater the quantity of earth to be raiſed is, the greater is the effect of the mine, ſuppoſing it to have the due proportion of powder. Powder has the ſame effect upon maſonry as upon earth, that is, it will proportionably raiſe either, with the ſame velocity.

The branches which are carried into the ſolidity of walls, do not exceed three feet in depth, and two feet ſix inches in width nearly; this ſort of mine is moſt excellent to blow up the ſtrongeſt walls.

The weight of a cubic foot of powder ſhould be 80 ℔. one foot one inch cube will weigh 100 ℔. and one foot two inches and eleven twelfths, 150 ℔. and 200 ℔. of powder will be one foot five inches cube; however, there is a diverſity in this, according to the quantity of ſalt peter in the gun-powder.

If, when the mines are made, water be found at the bottom of the chamber, planks are laid there, on which the powder is placed either in ſacks or barrels, of 100 ℔. each. The ſauciſſe muſt have a clear paſſage to the powder, and be laid in an auget, or wooden trough, through all the branches. When the powder is placed in the chamber, the planks are laid to cover it, and others again acroſs theſe; then one is placed over the top of the chamber, which is ſhaped for that purpoſe: between that and thoſe which cover the powder, props are placed, which ſhore it up; ſome inclining towards the outſide, others to the inſide of the wall; all the void ſpaces being filled with earth, dung, brick, and rough ſtones. Afterwards planks are placed at the entrance of the chamber with one acroſs the top, whereon they buttreſs three ſtrong props, whoſe other ends are likewiſe proped againſt another plank ſituated on the ſide of the earth in the branch; which props being well fixed between the planks with wedges, the branch ſhould then be filled up to its entrance with the forementioned materials. The ſauciſſes which paſs through the ſide branches muſt be exactly the ſame length with that in the middle, to which they join: the part which reaches beyond the entrance of the mine, is that which conveys the fire to the other three; the ſauciſſes being of equal length will ſpring together.

From a great number of experiments, it appears, 1. That the force of a mine is always towards the weakeſt ſide; ſo that the diſpoſition of the chamber of a mine does not at all contribute to determine this effect. 2. That the quantity of powder muſt be greater or leſs, in proportion to the greater or leſs weight of the bodies to be raiſed, and to their greater or leſs coheſion; ſo that you are to allow for each cubic fathom

Of looſe earth,	9 or 10 ℔.
Firm earth and ſtrong ſand,	11 or 12
Fat clayey earth,	15 or 16
New maſonry, not ſtrongly bound,	15 or 20
Old maſonry, well bound,	25 or 30

3. That the aperture, or entonnoir of a mine, if right charged, is a cone, the diameter of whoſe baſe is double the height taken from the center of the mine. 4. That when the mine has been overcharged, its entonnoir is nearly cylindrical, the diameter of the upper extreme not much exceeding that of the chamber. 5. That beſides the ſhock of the powder againſt the bodies it takes up, it likewiſe cruſhes all the earth that borders upon it, both underneath and ſideways.

To charge a mine ſo as to have the moſt advantageous effect, the weight of the matter to be carried muſt be known; that is, the ſolidity of a right cone, whoſe baſe is double the height of the earth over the center of the mine: thus having found the ſolidity of the cone in cubic fathoms, multiply the number of fathoms by the number of pounds of powder neceſſary for raiſing the matter it contains; and if the cone contains matters of different weights, take a mean weight between them all, always having a regard to their degree of coheſion.

As to the diſpoſition of mines, there is but one general rule, which is, that the ſide towards which one would determine the effect be the weakeſt, but this varies according to occaſions and circumſtances.

The calculation of mines is generally built upon this hypotheſis, that the entonnoir of a mine is the fruſtum of an inverted cone, whoſe altitude is equal to the radius of the excavation of the mine, and the diameter of whoſe leſſer baſe is equal to the line of leaſt reſiſtance; and though

though these suppositions are not quite exact, yet the calculation of mines deduced from them have proved succesful in practice; for which reason this calculation should be followed, till a better and more simple be found out.

M. de Valliere found that the entonnoir of a mine was a paraboloid, which is a solid generated by the rotation of a semi-parabola about its axis; but as the difference between these two is very insignificant in practice, that of the frustum of a cone may be used. See the article PARABOLOIDES.

Knight of the MINE, a military honour anciently conferred on persons who had distinguished themselves in engagements in mines.

MINE *Ships*, ships filled with gun-powder, inclosed in strong vaults of stone or brick, to be fired in the midst of an enemy's fleet.

MINEHEAD, a borough and port-town of Somersetshire, which sends two members to parliament: west long. 3° 20', north lat. 51° 18'.

MINERAL, in natural history, is used, in general, for all fossil bodies, whether simple or compound, dug out of a subterraneous mine, from which it takes its denomination. See FOSSIL and MINE.

In this sense, metals, sulphurs, fossil salts, semi-metals, &c. are minerals. See the articles METALS, SULPHUR, &c.

Boerhaave defines minerals natural bodies, found either in the bowels or on the surface of the earth, of so simple a structure that the closest inspection, even by the best microscopes, has not been able to discover any diversity between the vessels and their contents; but each part appears similar to the whole, though in many of them there certainly is a composition of solid and fluid parts.

Upon this definition Dr. Shaw remarks, that the character holds of fossils, and of them alone: thus gold, silver, and the other metals, antimony, salts, sulphurs, stones, and other minerals, really grow fixed to the earth; and if they be divided into the minutest parts, they will every where appear of the same similar solid matter, without any shew of vessels or juices.

MINERAL *Waters*, in medicine, all those wherein any medicinal virtues, besides those of common water, are found.

These mineral waters are of various kinds, but they are considered under the general titles of chalybeate, purgative, and alterative. The more useful and commodious additions for examining these three kinds of mineral waters, are, according to Dr. Shaw, galls, syrup of violets, and oil of tartar per deliquium. Galls discover in them any small proportion of vitriol or dissolved iron, as having the property of immediately striking a purple or black colour in all waters where any such substance is lodged. Spirit of violet, in the same manner, discovers any small predominancy of an acid or alkali therein, by changing the water red if acid, and green if alkali presides. Oil of tartar discovers any small proportion of earthy matter less capable of dissolving in water than that salt, by precipitating such earthy matter in form of a white cloud to the bottom of the containing glass, where it collects and appears like a subtile white powder. These particulars may be shewn and proved satisfactorily by adding to pure water a little of a known acid, alkali, dissolved iron, and subtile earth, or fine light sediment of an earthy water; applying the syrup of violets, galls, and oil of tartar respectively.

Mineral waters are imitable by art. The rule is, by a proper analysis to find the contents of such water (by evaporation, the addition of tinging ingredients, &c. as above mentioned) and their proportions; then, by means of synthetical chemistry, to compose a similar mixture: thus, for example, we learn, by a proper analysis, that the ingredients, or different constituent parts of pyrmont-waters, are a subtile aqueous fluid, a volatile iron, and a predominating alkali, all joined together in one brisk pungent spirituous water. The imitation of this kind of chalybeate water, is by much the most difficult, and may perhaps be rendered most perfect, by boiling the purest common water in a close vessel, with a small proportion of ochre, soft iron ore, or pyrites. See the articles PYRMONT and CHALYBEAT.

The imitation of the common purgative mineral waters is easy: thus Epsom-water is imitated by barely dissolving three or four drams of Epsom salt in a quart of pure water, made somewhat brisk or quick with a few drops of spirit of vitriol and oil of tartar per deliquium, so as to let the alkali prevail. See the articles EPSOM and PURGATIVE.

The imitation of the alterative waters, such as those of Bath, Buxton, &c. has hitherto

hitherto fcarce been attempted, nor can be rationally, for want of their refpective juft analyfis, upon which fuch imitations fhou'd always be grounded. See the articles BATH, BUXTON, &c.

As to the ufe of mineral waters, the learned Heifter obferves, that in general they are found to agree much better with perfons in the middle ftages of life, than with perfons very old or very young. If any general rule can be given in this cafe, it is, that people fhould not take them when younger than eighteen, or older than fixty.

As to the method of taking them, people who are of a plethoric habit ought to be blooded before they begin to take them, but all perfons ought to take a gentle purge before they begin them, in order to clear the primæ viæ; and to this purpofe, nothing is more proper than the common falts of Epfom or Glauber's. If there be indications for vomiting in the patient, fuch as pains, and a fenfation of weight, in the ftomach, with bitternefs in the mouth, then it is extremely proper to give, a day or two before the beginning of the courfes of the waters, a gentle dofe of ipecacuanha. The moft proper time for drinking them, is early in the morning; fix or feven o'clock is very proper. The moft proper feafon is the fummer, in the months of June, July and Auguft; but in urgent occafions, the courfe of them may be begun in May and continued till September. It is always proper to begin the ufe of them by fmall quantities, and gradually increafe them to larger; the firft day it may be proper to drink about a pint and a half, the fecond a quart may be drank, and on the third or fourth three pints. After this the quantity may be increafed to two quarts a day; and more than this it is not proper to take, unlefs the perfon be of a very robuft habit: the quantity that is taken as the moft may be continued every day till the courfe is finifhed, if the nature of the difeafe require it. In general, the mineral waters operate both by ftool and urine, but in fome they operate by ftool fingly, in others by urine.

MINERVALIA, in roman antiquity, feftivals celebrated in honour of Minerva, in the month of March; at which time the fcholars had a vacation, and ufually made a prefent to their mafters, called from this feftival minerval.

Thefe feftivals were otherwife called quinquatria, from their lafting five days. See the article QUINQUATRIA.

MINHO, a great river of Spain, which, taking its rife in Gallicia, divides that province from Portugal, and falls into the Atlantic at Caminha.

MINIATO, a town of Italy, fifteen miles weft of Florence.

MINIATURE, a delicate kind of painting, diftinguifhed from all others by the fmalnefs of the figures, its being performed with dots or points, inftead of lines; by the faintnefs of the colouring; its requiring to be viewed very near; and by its being ufually done on vellum. See PAINTING and REDUCTION.

This is the niceft and moft tedious of all kinds of painting, being performed wholly with the point of the pencil: for when the colours are laid on flat without dotting, though the figures be fmall, and the ground either vellum or paper, it is not called painting in miniature, but wafhing. There are fome painters who never ufe any white colour in painting in miniature, but make the ground of the vellum ferve to raife their figures; in which cafe the lights appear bright in proportion to the depth and ftrength of the colours of the figures. Others, before they go to work, give the vellum a light wafh with white-lead well prepared and purified. Thofe colours that have the leaft body, are the beft and moft commodious for painting in miniature; as carmine, ultramarine, fine lakes, and greens made of herbs and flowers; but befides thefe, the following colours are alfo made ufe of, *viz.* vermillion, black-lead, brown-red, mafticote-pale, yellow-mafticote, indigo, ivory-black, lamp-black, fpanifh-brown, umber, gall-ftone, brown-ochre, french-pink, orpiment, gamboge, naples yellow, bladder-green, verditer, fea-green, german-afhes, flake-white, and white-lead. All terrene colours, and other grofs fubftances, are too coarfe for fine work, how well foever they may be ground; but the fineft particles may be feparated by tempering the colour in a cup of fair water, and having ftirred it well with your finger, and the whole being thoroughly mixed, let it fubfide for a while, and then pour it by inclination into a fhell that has been well fcowred in hot water, and let it ftand to dry. Yellow-ochre, brown-red, umber, and ultramarine purify by fire; but if they are burnt in too fierce a fire they change,

change, and the brown-red turns yellow; the yellow ochre and umber turn reddish, and so of the rest: if the fire is not too fierce it renders them softer and kinder than before, so that the finest and purest ultramarine, burnt in a red-hot shovel, becomes much more brilliant than it was before it was burnt. Greens, blacks, greys and yellows, on being mixed with a little of the gall of the ox, carp, or eel, especially of the last, acquire a lustre and vivacity not natural to them. You must take the galls of eels and hang them on a nail to dry; and when you use any, steep it in brandy, and mingle some of it with the colour already tempered with gum-water in which there is a little sugar-candy. When you begin to paint, the colours must be placed on a small ivory-pallet of the size of your hand, in the middle of which should be placed the white, well spread out, and near it the lighter, and further off those darker colours you are going to use.

Your vellum must be glued to a copper-plate, or a piece of thin board, exactly of the same size with the intended piece; in doing which, the fair side of the vellum should be moistened with a fine wet linen; and a piece of white paper being put upon the back of it, it is to be applied to the plate or board, and stretching it upon it equally in all directions, the vellum, which ought to be every way a finger's breadth larger than what you glue it to, in order to be doubled over and glued behind. When your piece is sketched out upon the vellum, with a pencil, you must, with a little thin carmine, run over all the strokes that they may not be defaced in working, and this done clean your vellum with crumb of bread. In laying on the colours, begin with sketching or drawing with large, bold, but clear strokes, like those who paint in oil: your lights must at first be something brighter, and your shades not quite so dark as is required in finishing; because in strippling upon them you strengthen the colour, which if too deep at first, would in finishing become too dark. Endeavour also to drown your colours into each other, that no line of separation may be seen between them; to this purpose soften your strokes with the colours on each side of them, so that they may be blended and confounded with each other. There are several ways of strippling, and every painter has his manner; some do it with round points, others make them longish; others again hatch fine strokes, crossing each other in all directions, till the whole appears as if strippled or wrought with points; this last method is the best, boldest, and soonest perfected: the artist should here accustom himself to be rich, mellow, and soft in his work; the points must seem in a manner lost in the ground they are wrought upon, and appear but just enough to shew that the piece is strippled. When the work seems finished, heightening it a little has a fine effect; that is, strengthening the lights with touches of a paler colour than at first, which must be softened away into the rest.

For laces, point, and the like, lay on first a mixture of blue, black, and white, as for linens, and then heighten the pattern, flowers or flourishes, with white only; than shade and finish with the first colour. When they are upon flesh, or any thing else which you would have seen through them, finish what is under them, as if you intended to lay nothing upon it, and then lay on the lace or point with pure white, and finish with the other mixture. In painting a fur, lay on a ground as for drapery, according to the colours of it, and then shade by the same rule; and having done, instead of strippling, draw fine strokes this way and that, according as the down of the fur you imitate lies: heighten the lights of of a brown fur with ochre and white, and those of a light fur with white and a little blue.

There are several sorts of grounds for pictures and portraits; some are quite brown, with spanish-brown, umber, *&c.* with a little black and white; others are more yellow, being mixed with a good deal of ochre; others are upon the grey, with indigo; and others are blue or crimson. See the article GROUND.

To make a ground all of glory, first lay a bright mixture of a little ochre and white, adding more and more of the first as you draw more and more towards the extremities of the intended picture; and when the ochre happens not to be dark enough (for you must go on darkening and darkening) add gall-stone, then carmine, and at last spanish-brown. This ground you must lay in such a manner, that the different degrees of darkness may, as much as possible, insensibly increase and strengthen: the whole must then be strippled with the same colours.

For a day-sky, mingle some ultramarine with

with a good deal of white, and lay it on as ſmooth and uniform as poſſible with a large pencil and broad ſtrokes, laying it on paler and paler as you deſcend towards the horizon, which muſt be made of vermillion, mine-de-plumb and white, of the ſtrength that finiſhes the ſky, or rather a little weaker, artfully blending the blue and red, mingling at laſt gall-ſtone and a good deal of white; and all this muſt be ſo laid on that no ſeparation muſt be ſeen between the colours. When there are to be clouds in the ſky, you need lay on no blue where they are to be, but ſketch them out, if they are reddiſh, with vermillion, gall-ſtone, and white, together with a little indigo; and if they are to be darker, a great deal muſt be uſed of this laſt, making the lights of the one and the other with maſticot, vermillion and white, according to the degree of ſtrength you would give them, ſwelling out the whole with ſtrippling; and if the ſky be not ſufficiently uniform, you muſt ſtripple that likewiſe.

MINIM, in muſic, a note equal to two crotchets, or half a ſemibreve. See the articles NOTE, CROTCHET, &c.

MINIMS, a religious order in the church of Rome, founded by St. Francis De Paula, towards the end of the fifteenth century. Their habit is a coarſe black woollen ſtuff, with a woollen girdle, of the ſame colours, tied in five knots. They are not permitted to quit their habit and girdle night nor day. Formerly they went bare-footed, but are now allowed the uſe of ſhoes.

MINIMUM, in the higher geometry, the leaſt quantity attainable in a given caſe. See the article MAXIMUM.

MINION, a piece of cannon, at preſent but little uſed in the field. For its length, bore, and the weight of the ball it carries, ſee CANNON.

MINISTER, a perſon who preaches, performs religious worſhip in public, adminiſters the ſacraments, &c. See the articles BISHOP, DEACON, &c.

MINISTER *of ſtate*, a perſon to whom a ſovereign prince intruſts the adminiſtration of the government.

Foreign MINISTER, is a perſon ſent into a foreign country to manage the affairs of his province, or of the ſtate to which he belongs. Of theſe there are two kinds; thoſe of the firſt rank are embaſſadors and envoys extraordinary, who repreſent the perſons of their ſovereigns. The miniſters of the ſecond rank are the ordinary reſidents. See EMBASSADOR, &c.

MINIUM, or RED-LEAD, a preparation of lead uſed both in pharmacy and painting. It is made in the following manner: melt lead in a broad earthen veſſel unglazed, and ſtir it continually with a ſpatula till it be calcined into a grey powder; this is called the calx of lead: continue the fire, ſtirring it in the ſame manner, and it becomes yellow; in this ſtate it is called maſticot: after this put it into a reverberatory furnace and it will calcine farther, and become of a fine red, which is the common minium or red-lead. Minium is uſed externally on many occaſions. It obtunds the acrimony of the humours, allays inflammations, and is excellent in cleanſing and healing old ulcers; and on theſe occaſions, it is uſed in many of the plaſters and ointments of the ſhops.

In painting, red-lead is as heavy and ſtrong a colour as moſt we have; but when prepared, is the moſt delightful one. Mr. Boyle directs the preparing it as follows: put four ounces of it in a quart of rain-water; then ſtir it, and pour off the water immediately, and let it ſettle to the bottom of every cup or glaſs you pour it into; then pour off the water, and in a day's time you will have the colour dry, and as fine as you can deſire. Some ſhade red-lead with carmine, which has a fine effect, and renders it equal to the brighteſt red flower: when the carmine has ſhaded the red-lead, it may be ſhaded again with lake in the ſtrongeſt part.

MINOR, in law, is an heir, either male or female, before they arrive at the age of twenty-one; during the minority of ſuch, they are uſually incapable of acting for themſelves. See INFANT.

MINOR, in logic, the ſecond propoſition of a regular ſyllogiſm. See SYLLOGISM.

MINOR, in muſic, ſignifies leſs, and is applied to certain concords or intervals which differ from others of the ſame denomination by half a tone: thus we ſay a third minor, meaning a leſs third; a ſixth major and minor. See the articles SIXTH and THIRD.

Concords that admit of a major and minor, are called imperfect. See the article CONCORD.

MINORCA, an iſland in the Mediterranean, about twenty miles eaſt of Majorca, thirty miles long, and twelve broad,

broad. It is fubject to Great Britain, and only valued for its capacious harbour of Port Mahon.

MINORS, or FRIARS-MINOR, the fame with francifcans. See FRANCISCAN.

MINOTAUR, *minotaurus*, in antiquity, a fabulous monfter much talked of by the poets, feigned to be half man and half bull.

The minotaur was brought forth by Pafiphae, wife of Minos, king of Crete. It was fhut up in the labyrinth of that ifland, and at laft killed by Thefeus.

Servius gives the explanation of this fable: he fays that a fecretary of king Minos, named Taurus, bull, having an intrigue with the queen Pafiphae, in the chamber of Dædalus, fhe was at length delivered of twins; one of whom refembled Minos, and the other Taurus. This occafioned the production to be reputed monftrous.

MINOVERY, a trefpafs committed in the foreft, by fomething that is a man's handy work, as an engine to catch deer, &c. See the article FOREST.

MINOW, in ichthyology, a fmall fpecies of cyprinus, too well known to need a particular defcription. See CYPRINUS.

MINSTER, antiently fignified the church of a monaftery or convent.

MINSTREL, an antient term for a fidler, or player on any other kind of mufical inftrument.

MINT, the place in which the king's money is coined. See COINAGE.

There were antiently mints in almoft every county in England; but the only mint at prefent in the britifh dominions, is that in the Tower of London. The officers of the mint are, 1. The warden of the mint, who is chief; he overfees the other officers, and receives the bullion. 2. The mafter worker; who receives the bullion from the warden, caufes it to be melted, delivers it to the moneyers, and when it is coined receives it again. 3. The comptroller, who is the overfeer of all the inferior officers, and fees that all the money is made to the juft affize. 4. The affay-mafter; who weighs the gold and filver, and fees that it is according to the ftandard. 5. The auditor; who takes the accounts. 6. The furveyor of the melting; who after the affay-mafter has made trial of the bullion, fees that it is caft out, and not altered after it is delivered to the melter. 7. The engraver; who engraves the ftamps and dyes for the coinage of the money. 8. The clerk of the irons; who fees that the irons are clean and fit to work with. 9. The melter; who melts the bullion before it is coined. 10. The provoft of the mint; who provides for, and overfees all the moneyers. 11. The blanchers; who anneal and cleanfe the money. 12. The moneyers; fome of whom forge the money, fome fhear it, fome round and mill it, and fome ftamp or coin it. 13. The porters; who keep the gate of the mint.

MINT, *mentha*, in botany, a genus of the didynamia angiofpermia clafs of plants, the flower of which is monopetalous, and divided into four fegments at the limb: there is no pericarpium, the feeds being contained in the bottom of the cup.

Under this genus are comprehended the mentha, menthaftrum, and pulegium, or penny-royal of authors; all which are efteemed aperient and cephalic. Pepper-mint is highly extolled as a ftomachic and carminative: as is alfo fpear-mint. The diftilled water of this plant is given in flatulencies, and colics arifing from that kind of caufe.

MINUARTIA, in botany, a genus of the triandria trigynia clafs of plants, the calyx of which is a long, erect, five leafed perianthium. It has no corolla; the fruit is an oblong triangular capfule, compofed of three valves, and containing one cell, in which are a few roundifh, compreffed feeds.

MINUET, in mufic, a very graceful kind of dance, which confifts of a coupee, a high ftep, and a balance; it begins with a beat, and its motion is triple.

It has commonly two ftrains, each played twice over; the firft has four or eight bars, the laft of which fhould be either the dominant or mediant of the mode, but never the final: the fecond has eight bars, and ufually ends on the final of the mode, with a pointed minim, or whole bar.

MINUSCULE, the fmall letters, in contradiftinction to the majufculæ or capitals.

MINUTE, in geometry, the fixtieth part of a degree of a circle. See the articles CIRCLE and DEGREE.

Minutes are denoted by one acute accent, thus ($'$); as the fecond, or fixtieth part of a minute, is by two fuch accents, thus ($''$); and the third by three ($'''$), &c.

MINUTE *of time*, the fixtieth part of an hour. See the article HOUR.

MINUTE,

MINUTE, in architecture, usually denotes the sixtieth, sometimes the thirtieth part of a module. See the article MODULE.

MINUTE is also used for a short memoir, or sketch of a thing, taken in writing.

MIRABILIS, MARVEL OF PERU, in botany, a genus of the pentandria monogynia class of plants, with a monopetalous funnel-fashioned flower; its fruit is an ovato-pentagonal nut, containing a single globose seed.

Tournefort and Linnæus will have the root of this plant to be the jalap of the shops; but Houston declares, that jalap is the root of a species of convolvulus. See the article JALAP.

MIRACLE, is defined by Dr. Samuel Clarke, to be a work effected in a manner different from the common and regular method of providence, by the interposition either of God himself, or some intelligent agent superior to man.

It has been much controverted, whether true miracles can be worked by any less power than the immediate power of God; and whether to complete the evidence of a miracle, the nature of the doctrine pretended to be proved by it, is necessary to be taken into the consideration. The above learned author undertakes to set this matter in a clear light, as follows.

In respect to the power of God, and the nature of the things themselves, all things that are possible at all, are equally easy to be done: it is at least as great an act of power to cause the sun to move at all, as to cause it at any time to stand still; yet this latter we call a miracle, the former not.

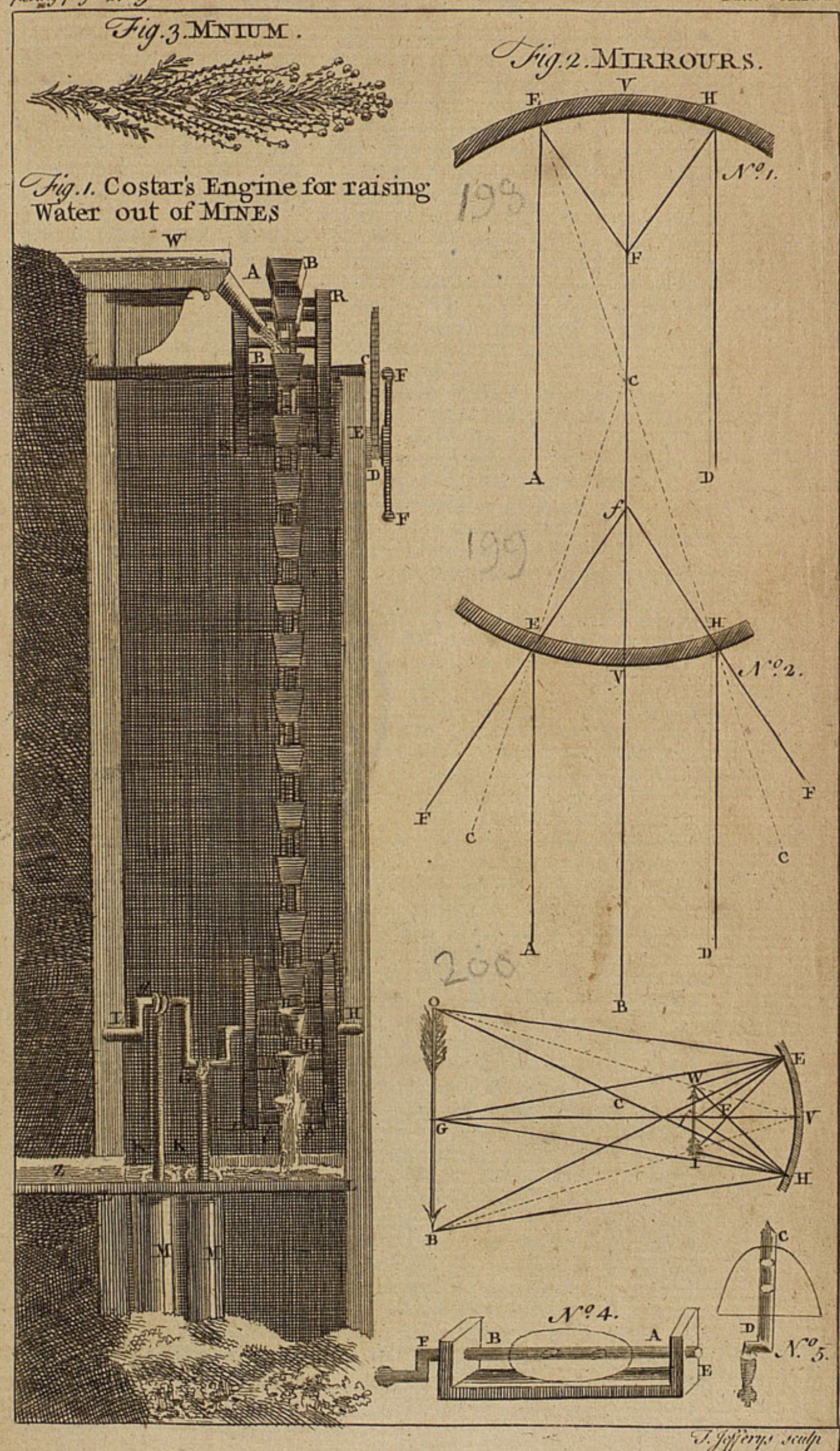
What degrees of power God may reasonably be supposed to have communicated to created beings, or subordinate intelligences, is impossible for us to determine: therefore a miracle is not rightly defined to be such an effect as could not have been produced by any less power than the divine omnipotence. There is no instance of any miracle in Scripture, which to an ordinary spectator would necessarily imply the immediate operation of original, absolute, and underived power.

All things that are done in the world, are done either immediately by God himself, or by created intelligent beings, matter not being at all capable of any laws or powers whatsoever; so that all those things which we say are the effects of the natural powers of matter and laws of motion, are properly the effects of God acting upon matter continually and every moment, either immediately by himself, or mediately by some created intelligent beings. Consequently it is no more against the course of nature for an angel to keep a man from sinking in the water, than for a man to hold a stone from falling in the air, by overpowering the law of gravitation; and yet the one is a miracle, the other not so.

The only possible ways by which a spectator may certainly and infallibly distinguish whether miracles be the works either immediately of God himself, or of some good angel employed by him; or whether, on the contrary, they are the works of evil spirits, are these: if the doctrine attested by miracles, be in itself impious, or manifestly tending to promote vice; then, without all question, the miracles, how great soever they may appear to us, are neither worked by God himself nor by his commission. If the doctrine itself be indifferent, and, at the same time, there be worked other miracles, more and greater than the former, then that doctrine which is attested by the superior power, must necessarily be believed to be divine: this was the case of Moses and the egyptian magicians. If, in the last place, the doctrine attested by miracles tends to promote the honour of God, and the practice of righteousness among men; and yet nevertheless be not in itself demonstrable, nor could without a revelation be discovered to be actually true; and there is no pretence of more and greater miracles to contradict it; which is the case of the doctrine and miracles of Christ; then the miracles are unquestionably divine, and the doctrine must, without all controversy, be acknowledged as an immediate and infallible revelation from God.

The lord Bacon observes, that a miracle was never wrought by God to convert an atheist, because the light of nature might have led him to confess a God: but miracles, says he, are designed to convert idolaters, and the superstitious, who have acknowledged a deity, but erred in the manner of adoring him; because no light of nature extends so far as fully to declare the will and true worship of God.

Acosta enquiring into the cause why miracles are not wrought by the present missionaries for the conversion of heathen nations, as they were by the christians of the primitive ages, gives this as one reason; that the christians at first were ig-


Fig. 3. MNIUM.
Fig. 2. MIRROURS.
Fig. 1. Costar's Engine for raising Water out of MINES
W
A
B
R
B
C
F
E
D
F
K
E
V
H
N.º 1.
F
C
A
D
f
E
H
N.º 2.
V
F
C
F
C
A
D
B
O
E
W
C
F
V
G
I
H
B
N.º 4.
F
B
A
E
C
D
N.º 5.
J. Jefferys sculp

norant men, and the gentiles learned; but now, on the contrary, all the learning in the world is employed in the defence of the Gofpel, and there is nothing but ignorance to oppofe it; and there can be no need of farther miracles in fo good a caufe, when it is in the hands of fuch able advocates againft fuch weak adverfaries.

MIRALETUS, in ichthyology, a fpecies of ray fifh, commonly called raja oculata, with a row of fpines round the eyes. See the article RAJA.

MIRANDA *de Douro*, a city of Portugal, in the province of Tralos Montes, fituated on the Douro: weft longitude 6° 45′, north latitude 41° 30′.

MIRANDA *de Ebro*, a town of old Caftile, in Spain: fituated on the river Ebro, forty-two miles north-eaft of Burgos: weft long. 3° 30′, north lat. 43°.

MIRANDOLA, a city of Italy, fixteen miles north of Modena.

MIRECOUR, a town of Lorrain, twenty-two miles fouth of Nancy.

MIREPOIX, a city of Languedoc, in France, thirty-two miles fouth-eaft of Touloufe.

MIRROUR, *fpeculum*, in catoptrics, any polifhed body, impervious to the rays of light, and which reflects them equally.

Mirrours were antiently made of metal; but, at prefent, are generally fmooth plates of glafs, tinned or quickfilvered on the back part, and called looking-glaffes.

The doctrine of mirrours depends wholly on that fundamental law, that the angle of reflection is always equal to the angle of incidence. See INCIDENCE.

Let E H (plate CLXXX. fig. 2. n° 1.) be a concave mirrour, V its vertex, and C the center of its concavity. Let A be a ray of the fun's light incident on the point E, and draw E C, which will be perpendicular to the mirrour in the point E; make the angle C E F equal to the angle AEC, then fhall EF be the reflected ray. Thus alfo H F will be the reflected ray of the incident one D H, at an equal diftance on the other fide of the axis B V.

If now the points E and H be taken very near the vertex V, we fhall have E F, or HF, very nearly equal to F V; but E F = F C; therefore $FV = FC = \frac{1}{2} CV$. That is, the focal diftance F V of parallel rays will be at the diftance of half the radius C V of the concavity of the mirrour, from the vertex V, in the axis B V.

After the fame manner, a convex mirrour is fhewn to reflect the rays A B, D H, (*ibid.* n° 2.) into E F, H F, as if they came diverging from a point *f* in the axis C V, which is half the radius C V diftant from the vertex V. But fince the rays do not actually come at, or from the focus *f*, it is called the imaginary or virtual focus. See FOCUS.

Parallel rays falling directly on a plane fpeculum are reflected back upon themfelves; if they fall obliquely, they are reflected in the fame angle, and parallel as they fell. Hence there is no fuch thing, properly fpeaking, as a focus belonging to a plane fpeculum, neither real nor virtual.

The focus F, or *f*, of parallel rays, is called the folar focus; becaufe in that the image of the fun is formed, and of all objects very remote. But the focus of any object fituated near the mirrour will have its diftance from the vertex more or lefs than half the radius; the rule in all cafes being as follows:

Multiply the diftance of the object into the radius of the mirrour, and divide the product by the fum of the radius and twice the diftance of the object; the quotient will be the focal diftance of a convex mirrour.

Again for a concave mirrour, the fame product of the radius into the diftance of the object, divided by the difference of radius and twice the diftance of the object, will give the focal diftance V F or V*f*. And here we are to obferve, that, as twice the diftance of the object is leffer or greater than the radius, fo the focus will be pofitive or negative, that is, behind the glafs or before it.

The image of the object is formed in the focus proper to its diftance: and, fince the writers on optics demonftrate that the angles under which the object O B (*ibid.* n° 3.) and its image I W are feen from the center or vertex of the mirrour C are always equal, it follows, that the image I W will be always in proportion to the object O B, as the focal diftance V F to the object's diftance G V.

The pofition of the object will be always erect at a pofitive focus, or behind the fpeculum; diminifhed by a convex, and magnified by a concave one. Hence, fince a convex has but one, *viz.* an affirmative focus; fo it can never magnify any object, howfoever pofited before it.

The pofition of the image in a negative focus, or that before the glafs, will be ever inverted; and, if nearer the vertex than the

the center C, it will be lefs; if farther from it, it will be greater than the object; but in the center it will be equal to the object, and feem to touch it.

The image formed by a plane fpeculum is erect; large as the life; at the fame apparent diftance behind the glafs as the object is before it; and on the fame fide of the glafs with the object. Thofe properties render this fort of mirrour of moft common ufe, *viz.* as a looking-glafs.

If the rays fall directly, or nearly fo, on a plane mirrour, and the object be opake, there will be but one fingle image formed, or at leaft be vifible; and that by the fecond furface of the fpeculum, and not by the firft, through which the rays do moft of them pafs.

But if the object be luminous, and the rays fall very obliquely on the fpeculum, there will be more than one image formed, to an eye placed in a proper pofition to view them. The firft image being formed by the firft furface will not be fo bright as the fecond, which is formed by the fecond furface. The third, fourth, &c. images are produced by feveral reflections of the rays between the two furfaces of the fpeculum; and, fince fome light is loft by each reflection, the images from the fecond will appear ftill more faint and obfcure, to the eighth, ninth, or tenth, which can fcarcely be difcerned at all.

Mirrours may be divided into plane, concave, convex, cylindrical, conical, parabolical, and elliptical.

The beft manner of preparing convex mirrours hitherto known is given us by Wolfius, thus:

Melt one part of tin, another of marcafite, together, and to this mafs add two parts of mercury; as foon as the mercury begins to evaporate into fmoke, the whole is to be thrown into cold water, and, when well cooled, the water decanted off. Strain the mixture through two or three folds of linen cloth; and what is thus fecreted pour into the cavity of a glafs fphere, which is to be turned gently round its axis till the whole furface be covered; the reft being referved for future ufe. If the fphere were of coloured glafs, the mirrour will be fo too. And in like manner may conic, elliptic, cylindric, and other mirrours be made. See the article Foliating.

For elliptical, parabolical, and hyperbolical mirrours, the mould is to be thus prepared; on a wooden or brafs-plane defcribe an ellipfis A B (*ibid.* n° 4.) alfo a parabola or hyperbola, C D (*ibid.* n° 5.) then cut out the figure from the plane with all the accuracy imaginable.

To the elliptic figure fit an axis, as EF, with two fulcra to fuftain it, &c. and a handle to move it. Lay a quantity of the clay under it, and turn about the axis by the handle, till the plane A B have impreffed the elliptical figure exactly thereon.

The axis of the parabolical or hyperbolical figure C D is to be fixed at the vertex fo as to be always erect. This is to be turned about, till it have given its figure to the clay round it.

The part of the mould thus formed is to be dried, and then fmeared over with fat, &c. then a convex mould is to be made by putting a quantity of the fame clay into the cavity thus formed. The latter is called the male, as the former is the female mould. The male mould, when dry, is to be applied within the female, fo as to leave the intended thicknefs of the mirrour between them. Thefe mirrours are very difficult to be made, as the figure thereof is apt to be damaged in the grinding. See the article Grinding.

The properties of cylindrical mirrours are, 1. The dimenfions of objects correfponding lengthwife to the mirrour are not much changed; but thofe correfponding breadthwife have their figures altered and their dimenfions leffened the farther from the mirrour; whence arifes a very great diftortion. 2. If the plane of the reflection cut the cylindric mirrour thro' the axis, the reflection is performed in the fame manner as in a plane mirrour; and if parallel to the bafe, the reflection is the fame as in a fpherical mirrour; if it cut it obliquely, the reflection is the fame as in an elliptic mirrour. Hence, as the plane of reflection never paffes thro' the axis of the mirrour, except when the eye and objective line are in the fame plane; nor parallel to the bafe, except when the radiant point and the eye are at the fame height; the reflection is therefore ufually the fame as in an elliptic one. 3. If a hollow cylindric mirrour be directly oppofed to the fun, inftead of a focus of a point, the rays will be reflected into a lucid line parallel to its axis, at a diftance fomewhat lefs than a fourth of its diameter. Hence arifes a method of drawing anamorphofis,

morphoses, that is, wild deformed figures on a plane, which appear well proportioned, when viewed in a cylindric mirrour.

In an elliptic mirrour, if a ray strike on it from one of its focuses, it is reflected into the other.

In parabolic mirrours, as all the rays they reflect meet in one point, they make the best burning-glasses.

MIS, a negative particle prefixed to words, particularly law-terms, generally signifying a fault or defect; as misprision, misnomer, *&c.* See MISPRISION, *&c.*

MISADVENTURE, in law, is by some taken to signify the killing a person partly by negligence, and partly by chance, as where a person is killed by a stone thrown at random: other lawyers define it, a person's coming to his death by some accidental outward violence, as by a stroke of a horse, the fall of a tree, or the like.

MISCHNAH, or MISNAH, the code or collection of the civil law of the Jews. The Jews pretend, that when God gave the written law to Moses, he gave him also another not written, which was preserved by tradition among the doctors of the synagogue, till rabbi Judah, surnamed the Holy, seeing the danger they were in, through their dispersion, of departing from the traditions of their fathers, judged it proper to reduce them to writing.

The misnah is divided into six parts: the first relates to the distinction of seeds in a field, to trees, fruits, tythes, *&c.* The second regulates the manner of observing festivals: the third treats of women, and matrimonial cases: the fourth of losses in trade, *&c.* the fifth is on obligations, sacrifices, *&c.* and the sixth treats of the several sorts of purification. See the article TALMUD.

MISCONTINUANCE, in law, the same with discontinuance. See the article DISCONTINUANCE.

MISDEMEANOUR, in law, signifies a heinous offence or fault, particularly in the execution of an office.

MISE, in law-books, is used in various senses: thus it sometimes signifies costs or expences, in which sense it is commonly used in entering of judgments in actions personal. It is also used for the issue to be tried on the grand assize, in which case, joining of the mise upon the meer right, is putting in issue between the tenant and demandant, who has the best or clearest right.

Mise also signifies a tribute, or customary present formerly paid in the county palatine of Chester, on the change of every owner of that earldom, for the enjoyment of their liberties.

MISEN, or MIZEN, in a ship. See the article MIZEN.

MISERERE MEI, in medicine, a name by which some call the iliac passion. See the article ILIAC.

MISERICORDIA, in law, is an arbitrary fine imposed on any person for an offence: this is called misericordia, because the amercement ought to be but small, and less than that required by magna charta. If a person be outrageously amerced, in a court that is not of record, the writ called moderata misericordia lies for moderating the amercement according to the nature of the fault.

MISITHRA, or LACEDÆMON. See the article LACEDÆMON.

MISFEASANCE, in law-books, signifies a trespass. See the article TRESPASS.

MISLETOE, *viscum*, in botany. See the article VISCUM.

MISNAH, or MISCHNAH. See the article MISCHNAH.

MISNIA, or MEISSEN. See MEISSEN.

MISNOMER, in law, a misnaming, or mistaking a person's name. The christian name of a person should always be perfect, but the law is not so strict and precise in regard to surnames, a small mistake in which will be dispensed with to make good a contract, and support the act of the party.

MISPRISION, signifies, in general, some neglect or over sight; as where a person is privy to a treason or felony committed by another, and neglects to reveal it to the king or his council, or to a magistrate; but entirely conceals it: this is called misprision of those crimes. In cases of misprision of treason, the offender is to be imprisoned for life, and to forfeit his goods and chattels, together with the profits of his lands, *&c.* but in misprision of felony, the offender is only to be punished with fine and imprisonment, and to remain in prison till the fine is paid.

The word misprision, is taken for many great offences which are not treason or felony, but nearly allied to them; and all great misdemeanors that have no certain name appointed by the law, have sometimes been called misprision. There is also misprision at large, where a per-

fon contemns the king's prerogative by refufing to affift him, by writing or fpeaking againft his perfon or government, refufing to take the oaths of allegiance and fupremacy, &c.

MISSA, the mafs. See MASS.

MISSAL, the romifh mafs-book, containing the feveral maffes to be faid on particular days. See the article MASS.

MISSEL-BIRD, the englifh name of the greyifh-yellow turdus, with a fpotted breaft. See the article TURDUS.

It is the largeft bird of the turdus-kind, known among authors by the name of turdus vifcivorus major.

MISSEN, or MIZEN, in a fhip. See the article MIZEN.

MISSIONARIES, fuch ecclefiaftics as are fent by any chriftian church, into pagan or infidel countries, to convert the natives, and eftablifh the chriftian religion among them.

There are in France, and other popifh countries, feveral congregations of miffionaries, whofe principal end is to be employed on miffions, and to infpire into the young clerks that fpirit of piety and devotion which is neceffary for the worthy difcharge of their miniftry. Such are the congregations of the priefts of the miffion, the eudifts, the miffionaries of Lyons, and fome others. The moft remarkable of thefe congregations is that of the priefts of the miffion, which confifts of fecular clergy; who neverthelefs make four fimple vows, of poverty, chaftity, obedience, and perfeverance. Their habit is diftinguifhed from that of other ecclefiaftics only by a linen collar four fingers broad, and by their wearing a little tuft of beard.

MISSIVE, fomething fent to another, as miffive letters; meaning letters fent from one to another upon bufinefs, in contradiftinction to letters of gallantry, points of learning, difpatches, &c.

MIST, the fame with fog. See FOG.

MISUSER, in law, fignifies fome abufe of any particular liberty or benefit. The charter of a corporation, as well as an office, may be forfeited by mifufer.

MISY, in natural hiftory, a fpecies of the chalcantha, a foffil very common in the turkifh dominions, and fometimes found in the mines at Cremnitz in Hungary. See the article CHALCANTHA.

It is a confiderably firm fubftance, of an irregular texture, not compact, much refembling fome of our more gaudy marchafites, but wanting in their hardnefs and weight. It is of no determinate fhape or fize, but is oftentimes found in fmall detached maffes, which are ufually broad, flat, and very rugged at the edges. As to its medical virtues, they are no other than thofe of the green vitriol. See the article VITRIOL.

MITCHELLA, in botany, a genus of the tetrandria monogynia clafs of plants, the calyx of which confifts of two flowers, placed upon the germen, the corolla is monopetalous, and funnel-fhaped; the fruit is a bipartite, globofe berry; the feeds are compreffed, and callous.

MITE, a fmall coin formerly current, equal to about one third part of a farthing.

It alfo denotes a fmall weight ufed by the moneyers. It is equal to the twentieth part of a grain, and is divided into twenty-four doits.

MITE, in zoology. See ACARUS.

MITELLA, in botany, a genus of the decandria digynia clafs of plants, the corolla whereof confifts of five patent petals, of an oblong figure, longer than the fegments of the cup, with their ungues narrow, and inferted into the calyx: the fruit is a capfule of a globofe figure, but with a point formed of two valves, and opening between, containing only one cell: the feeds are numerous, and of a roundifh oblong figure.

MITHRIDATE, in pharmacy, a compound medicine in form of an electuary, ferving either as a remedy or prefervative againft poifons; being alfo accounted a cordial, opiate, fudorific, and alexipharmic.

Mithridate is one of the capital medicines in the apothecaries fhops; the preparation of it, according to the direction of the college, is as follows: take of cinnamon, fourteen drams; of myrrh, eleven drams; agaric, fpikenard, ginger, faffron, feeds of treacle-muftard, frankincenfe, chio-turpentine, of each ten drams; camels-hay, coftus, indian leaf, french lavender, long pepper, feeds of hartwort, juice of the rape of ciftus, ftrained ftorax, opopanax, ftrained galbanum, balfam of Gilead, or in its ftead expreffed oil of nutmegs, ruffia-caftor, of each an ounce; poley-mountain, water-germander, the fruit of the balfam-tree, feeds of the carrat of Crete, bdellium ftrained, of each feven drams; celtic nard, gentian-root, leaves of dittany of Crete, red rofes, feed of macedonian parfley, the leffer cardamom-feeds freed

from their husks, sweet fennel seeds, gum arabic, opium strained, of each five drams; root of the sweet flag, root of wild valerian, anniseed, sagapenum strained, of each three drams; spignel, St. John's wort, juice of acacia, the bellies of skinks, of each two drams and a half; of clarified honey, thrice the weight of all the rest; dissolve the opium first in a little wine, and then mix it with the honey made hot. In the mean time melt together in another vessel the galbanum, storax, turpentine, and the balsam of Gilead, or the expressed oil of nutmeg, continually stirring them round that they may not burn; and as soon as these are melted, add to them the hot honey, first by spoonfuls, and afterwards more freely; lastly, when this mixture is near cold, add by degrees the rest of the species reduced to powder.

MITRALES VALVULÆ, mitral valves, in anatomy, two valves situated in the left ventricle of the heart, at the ingress of the pulmonary vein, serving to hinder the ingress and regress of the blood from the heart into the veins again, while they are constricted. See HEART.

MITRE, a sacredotal ornament worn on the head by bishops, and certain abbots on solemn occasions; being a sort of cap, pointed, and cleft at top. The high-priest among the Jews wore a mitre or bonnet on his head. The inferior priests among the Jews had likewise their mitres, but in what respect they differed from that of the high priest is uncertain. Some contend that the antient bishops wore mitres, but this is by no means certain. Those young women among the primitive christians, who professed a state of virginity, and were solemnly consecrated thereto, wore a purple and golden mitre, as a badge of distinction. His holiness the pope has no less than four different mitres, which are more or less rich, according to the solemnities of the festivals on which they are worn. The cardinals antiently wore mitres; some canons of cathedrals, in popish countries, have the privilege of wearing the mitre; and some great families in Germany bear it for their crest.

MITRE-SHELL, the smooth and slender buccinum, with a split rostrum. See the article BUCCINUM.

MITREOLA, in botany, a plant of the pentandria-digynia class, the flower of which consists of a single campanulated petal, divided into five segments at the limb: the fruit is an erect simple bilocular capsule, containing numerous small and roundish seeds.

MITTAU, the capital of the dutchy of Courland, in Poland: situated in east long. 24°, north lat. 56° 40′.

MITTENDO MANUSCRIPTUM PEDIS FINIS, in law, an antient judicial writ, directed to the treasurer and chamberlain of the exchequer, requiring them to search for and transmit the foot of a fine, acknowledged before the justices in eyre into the common pleas, *&c.*

MITTIMUS, as generally used, hath two significations. 1. It signifies a writ for removing and transferring of records from one court to another. 2. It signifies a precept, or command in writing under the hand and seal of a justice of the peace, directed to the gaoler or keeper of some prison, for the receiving and safe-keeping of an offender charged with any crime until he be delivered by due course of law.

MIXT, or MIXT BODY, in philosophy and chemistry, that which is compounded of different elements or principles; in which sense it stands contradistinguished from simple or elementary, which is applied to bodies consisting of one principle only, as the chemists take sulphur, salt, *&c.* to do. The business of chemistry is, to resolve mixt bodies into their principles, or component parts.

MIXT ACTION, in law, is an action partly real, and partly personal, which lies both for the thing detained, and against the person of the detainer. See ACTION.

MIXTURE, a compound, or assemblage of several different bodies in the same mass. Dr. Shaw observes, that the mixtures, resolutions, and compositions made by chemistry, are extremely numerous, and may be increased ad infinitum. By mixture, says he, we produce all the artificial vitriols, soaps, glasses, *&c.* and can compound these again in an almost infinite variety. So that of the resolutions, mixtures, compositions, and recompositions in chemistry, there seems to be no bounds; whence great room is left, for the making of new chemical discoveries. Dr. Pemberton justly censures the irregular and inartificial mixtures used in pharmacy, and observes, that they were introduced by the ignorance of the first ages, and enforced by the perpetual fear and jealousies of poisons, against which the antients endlessly busied themselves in the search of antidotes, vainly hoping

to frame compofitions that might fingly prevail againft every fpecies of poifon; hence they amaffed together whatever they imagined to be endued with alexipharmic powers. By this procedure the fimplicity of phyfic was loft, and a wantonnefs in mixing, enlarging, and accumulating took place, which has continued even to our times. The great Mr. Boyle has largely confidered this fubject, and among other arguments, fays, it is reafonable to fufpect, that where a great many ingredients are blended into a fingle medicine, one or other of them may have different operations from thofe defigned by the phyfician; and, by awakening fome fleeping ferment, produce a new diftemper, or excite and actuate fome other hoftile matter, that before lay quiet, and which would have been gradually fubdued by nature, had it not been unfeafonably rouzed, and affifted by fome ingredient, that perhaps was without any reafon added to the medicine. See MEDICINE.

MIXTURA SIMPLEX, a medicinal preparation, made in the following manner: Take of the fpiritus theriacalis camphoratus of Bates, ten ounces; fpirit of vitriol, two ounces; rectified fpirit of tartar, fix ounces. Digeft in a glafs-veffel, hermetically fealed, for three weeks. This medicine excites fweat, refifts putrefaction, and is good in malignant fevers. The dofe is about a dram.

MIZEN, in the fea-language, is a particular maft or fail. The mizen-maft ftands in the fternmoft part of the fhip. In fome great fhips there are two of thefe; when that next the main-maft is called the main mizen, and that next the poop, the bonaventure-mizen. The length of the mizen-maft, is, by fome, accounted the fame with the height of the main top-maft from the quarter-deck; or half the length of the main-maft, and half as thick. The fail which belongs to the mizen-maft, is called the mizen-fail: and when the word mizen is ufed at fea, it always means the fail. The ufe of the mizen is to keep the fhip clofe to the wind, or when a fhip rides at anchor, to back her a-ftern, fo that fhe may not foul her anchor, on the turning of the tide. The term mizen is ufed in the following phrafes: fet the mizen, that is, fit the mizen-fail right as it fhould ftand. Change the mizen, or bring the mizen-yard over to the other fide of the maft. Peak the mizen, or put the mizen-yard right up and down by the maft. Spell the mizen, or let go the fheet and peak it up.

MNEMONIC, fomething relating to memory. See the article MEMORY.

MNIUM, in botany, a genus of moffes, confifting of ftalks furnifhed with leaves, and producing capfules raifed on pedicles, like thofe of the other moffes of this clafs; but befides thefe, there are other pedicles, bearing a kind of naked heads, with a dufty furface, and having no calyptræ. Thefe two kinds of heads are, in fome fpecies, produced on the fame plant; and in others, on different plants of the fame fpecies. The pedicles that fupport the capfules are long, and naked; whereas thofe fupporting the dufty heads are fhort, and in fome fpecies furnifhed with fhort leaves. See plate CLXXX. fig. 3.

MOAR-LOVRE, in hufbandry, a fort of blight, which happens moftly on light land, from the earth's finking away from the roots, fo that the plants fall down to the earth.

To remedy this, they turn a fhallow furrow againft the rows, when they are ftrong enough to bear it, and when the mould is fine and dry, for then the motion of the ftalks by the wind will caufe fuch earth to run through the rows, and fettle about the roots, and cover them.

MOARING, or MOORING, in the fea-language, See the article MOORING.

MOAT, or DITCH, in fortification, a deep trench dug round the rampart of a fortified place, to prevent furprizes.

The brink of the moat, next the rampart, is called the fcarpe; and the oppofite one, the counterfcarpe.

A dry moat round a large place, with a ftrong garrifon, is preferable to one full of water; becaufe the paffage may be difputed inch by inch, and the befiegers when lodged in it, are continually expofed to the bombs, granades, and other fire-works, which are thrown inceffantly from the rampart into their works. In the middle of dry moats, there is fometimes another fmall one, called cunette; which is generally dug fo deep, till they find water to fill it.

The deepeft and broadeft moats are accounted the beft, but a deep one is preferable to a broad one: the ordinary breadth is about twenty fathoms, and the depth about fixteen.

To drain a moat that is full of water, they

they dig a trench deeper than the level of the water, to let it run off; and then throw hurdles upon the mud and flime, covering them with earth or bundles of rufhes, to make a fure and firm paffage.

MOBILE, or PRIMUM MOBILE, the ninth fphere in the ptolemaic fyftem of aftronomy. See the article PTOLEMAIC.

Perpetual MOBILE, or MOVEMENT. See the article MOVEMENT.

MOBILIA, in law, the fame with moveables. See MOVEABLE GOODS.

MOCO, or MOCHO, a great city and port-town of Arabia Fœlix, fituated near the ftraits of Babelmandel, at the entrance of the Red-Sea: eaft long. 45°, north lat 13°.

MODAL PROPOSITIONS, in logic, fuch as include certain reftrictions. See the article PROPOSITION.

MODBURY, a market-town of Devonfhire, 32 miles fouth-weft of Exeter.

MODE, *modus*, in philofophy, denotes the manner of a thing's exiftence, which is twofold, *viz.* fimple or mixed.

Simple modes are only combinations of the fame fimple idea: thus by adding units together, in diftinct feparate collections, we come by all the feveral modes of numbers, as a *dozen*, a *fcore*, a *thoufand*, &c. Mixed modes, on the contrary, are compounded of fimple ideas of different kinds, as *beauty*, which confifts in a certain compofition of colour and figure, caufing delight in the beholder: fuch alfo is *theft*, which is the concealed change of the poffeffion of a thing, without the confent of the proprietor.

Concerning fimple modes, Mr. Locke obferves, that they are as perfectly different and diftinct ideas in the mind, as thofe of the greateft diftance and contrariety: thus *two* is as diftinct from *three*, as bluenefs from heat.

To the head of fimple modes, the fame great philofopher refers fpace and extenfion, duration, and its fimple modes, numbers, infinity, &c. alfo thinking, motion, found, colour, pleafure, pain, &c. See SPACE, DURATION, &c.

There are three ways, he obferves, whereby we get the complex ideas of mixed modes. 1. By experience and obfervation of things themfelves: thus, by feeing two men wreftle, or box, we get the ideas of wreftling or boxing. 2. By invention, or voluntarily putting together of feveral fimple ideas in the mind: thus, he that firft invented printing, muft have had an idea of it in his mind before it ever exifted; for the mind being once furnifhed with fimple ideas, can put them together in feveral compofitions, without examining whether they exift fo together in nature: and hence it is, that fuch ideas are called notions, as if they exifted more in the minds of men than in the reality of things; and to form them, the mind only joins their feveral parts, without confidering whether they have any real exiftence. 3. By explaining the names of actions we never faw, or notions which we cannot fee; and by enumerating all the ideas that go to make them up: thus the mixed mode, which the word *lie* ftands for, is made up of thefe fimple ideas; articulate founds; certain ideas in the mind of the fpeaker; thofe words, the figns of thefe ideas; thofe figns put together by affirmation or negation, otherwife than the ideas they ftand for are in the mind of the fpeaker.

Mixed modes have their unity from an act of the mind, combining thofe feveral fimple ideas together, and confidering them as only one complex idea; and the mark of this union is one name given to that combination, whereby men endeavour to communicate their thoughts to one another with all poffible difpatch: and hence appears the reafon why there are words in every language, which cannot be rendered by any fingle word of another; becaufe the fafhions and cuftoms of one nation make feveral combinations, which another nation had never any occafion to make; as the oftracifm, ὀςρακισμὸς, among the Greeks; and profcription, among the Romans. This alfo occafions the conftant change of languages; becaufe the change of cuftoms and opinions brings with it new combinations of ideas, which, to avoid long defcriptions, have new names annexed to them. See WORD, LANGUAGE, &c.

Actions being the bufinefs of mankind, it is no wonder that their feveral modes fhould be treafured up in the memory, and have diftinct names affigned them, derived from their caufes, means, objects, ends, inftruments, time, place, and other circumftances. The powers too, fitted for thefe actions, form likewife diftinct modes: thus boldnefs is the power to do or fpeak what we intend, without fear or diforder.

The efficacy whereby the new idea is produced, is called, in the fubject exerting

erting that power, action; but in the ſubject wherein any ſimple idea is changed or produced, paſſion; which efficacy, in intellectual agents, can be nothing but modes of thinking and willing; and in corporeal agents, nothing but modifications of motion. Of any other ſort of action, we have no notion or idea; and therefore, many words, which ſeem to expreſs ſome action, ſignify only the effect, with ſome circumſtances of the ſubject wrought on, or cauſe operating. Thus creation, annihilation, *&c.* contain in them no idea of the action or manner, whereby they are produced; but barely of the cauſe, and the thing produced. In the ſame manner, when an ignorant perſon ſays that the cold freezes water, though the word freezing ſeem to import ſome action, yet it truly ſignifies nothing but the effect, *viz.* that the water, which was before fluid, is become hard and conſiſtent, without containing any idea of the action whereby it is done.

There are numerous other diviſions of modes, into immediate and mediate; eſſential and non-eſſential; poſitive and privative; of ſpirit and body; of thinking, *&c.*

Immediate MODES, are thoſe immediately attributed to their ſubjects, as motion in a body, knowledge, *&c.*

Mediate MODES, are thoſe attributed to ſubjects by the intervention of ſome other mode, as ſwiftneſs and ſlowneſs, which are attributable to a body, only in reſpect of motion.

Eſſential, or *inſeparable* MODES, are attributes without which the ſubſtance cannot ſubſiſt, as wiſdom, *&c.* in God, *&c.*

Non-eſſential, or *ſeparable* MODES, are attributes affecting created ſubſtances, and affixed thereto as long as is neceſſary, as coldneſs in water, *&c.*

Poſitive MODES, are thoſe which give ſomething poſitive to their ſubſtance, as roundneſs in a globe.

Privative MODES, are attributed to ſubjects, when the mind, perceiving ſomething wanting therein, frames a word which at firſt ſight ſeems to note ſomething poſitive, but in reality denotes the want of ſome mode.

MODES *of ſpirit* are two, knowledge and willing.

MODES *of body* are three, figure, reſt, and motion.

MODE, or MOOD *of ſyllogiſms*, among logicians. See SYLLOGISM.

MODE, in muſic, is defined to be a particular manner of conſtituting the octave; or, it is the melodious conſtitution of the octave, as it conſiſts of ſeven eſſential ſounds, beſides the key or fundamental. See the article OCTAVE.

A mode, then, is the particular order of the concinnous degrees of an octave; the fundamental note whereof may be called the key, as it ſignifies that principal note which regulates the reſt.

The proper difference, therefore, between a mode and a key is this, that an octave, with all its natural and concinnous degrees, is called a mode, with reſpect to the conſtitution or manner of dividing it; and, with reſpect to its place in the ſcale, it is called a key. Now it may be farther obſerved, that, of the natural notes of every mode, three go under the name of the eſſential notes, namely, the fundamental, the third and fifth; their octaves being reckoned the ſame, and marked with the ſame letters in the ſcale; the reſt are called dependents: Again, the fundamental is alſo called the final, the fifth the dominante; and the third, as being between the other two, the mediante.

The doctrine of the antients, with regard to modes, is ſomewhat obſcure.

Muſic was conſiderably improved in the eleventh century by Guido Aretinus, who, among other innovations, reformed the doctrine of modes. It is true, their number was fixed to ſeven; but afterwards conſidering the harmonical and arithmetical diviſions of the octave, whereby it reſolves into a fourth above a fifth, or a fifth above a fourth, they hence conſtituted twelve modes, making of each octave two different modes; but, becauſe there are two of them that cannot be divided both ways, there are but twelve modes. Of theſe ſuch as were divided harmonically, that is, with the fifths loweſt, which were ſix, were called authentic; and the other ſix, which had the fifths higheſt, were called plagal modes.

Plagal Octave.			Authentic Octave.
Fourth.	Fifth.		Fourth.
g	c	g	c
a	d	a	d
b	e	b	e
c	f	c	f
d	g	d	g
e	a	e	a

To

To theſe modes they gave the names of the antient greek towns, as Dorian, Phrygian, Lydian. But the ſeveral authors differ in the application and order of theſe names; ſo that we are ſtill at a loſs, what their real uſe was.

All we know is, they conſidered that an octave which wants a fourth or fifth is imperfect; theſe being the concords next to the octave, the ſong ought to touch thoſe chords moſt frequently; and becauſe the concord is different, which makes the melody different, they eſtabliſhed by this two modes in every natural octave that had a true fourth or fifth: Then, if the ſong was carried as far as this octave above, it was called a perfect mode; if leſs, as to the fourth or fifth, it was called imperfect; if it moved both above and below, it was called a mixed mode. Others conſidering how indiſpenſable a chord the fifth is in every mode, took for the key-note, in the arithmetically divided octaves, not the loweſt chord of that octave, but that very fourth. The only difference then in this method between the authentic and plagal modes is, that the authentic goes above its final to the octave; the other aſcends a fifth, and deſcends a fourth: which will indeed be attended with different effects, but the mode is eſſentially the ſame, having the ſame final to which all the notes refer.

The modes of authentic or plagal differ among themſelves, either by ſtanding higher or lower in the ſcale, that is, by the different tenſion of the whole octave, or rather by the different ſubdiviſion of the octave into its concinnous degrees.

That one mode ſhould produce mirth, another ſadneſs, and that a third ſhould be proper for religion, a fourth for love, &c. that theſe effects are owing merely to the conſtitution of the octave, ſcarce any body will affirm. The differences in the conſtitution will, it is true, have ſome little influence; the greateſt difference is that of thoſe octaves which have the 3d *l*, or 3d *g*, making what on other occaſions we call the ſharp and flat key. It is particularly obſervable that thoſe who give us examples in actual compoſition of their twelve modes, frequently take in the artificial notes ♯ and ♭ to perfect the melody of their key, and by this means depart from the conſtitution of the octave, as it ſtands fixed in the natural ſyſtem. Therefore, the modes are all really reducible to two, *viz.* the ſharp and flat; the other differences reſpecting only the place of the ſcale, where the fundamental is taken.

Originally, there were but three antient modes, namely, the Doric, Lydian, and Phrygian, which were particularly called tones, as being at a tone's diſtance from each other: the reſt were afterwards added, and denominated from the relation they bore to the former, particularly the Hypodoric, as being below the Doric.

Beſides theſe modes of tune, there were modes of time, at firſt diſtinguiſhed into greater and leſſer; and each of theſe again into perfect and imperfect. But afterwards they were reduced to four, which are now diſuſed.

The common mode now in uſe is much more ſimple than any of thoſe; the proportion, which in theirs is varied, being in ours fixed, namely, 2 : 1. A large is equal to 2 longs, a long to two breves, a breve to 2 ſemi-breves, &c. And, if on ſome occaſions, the proportion of 3 : 1 betwixt two ſucceſſive notes is required, it is eaſily expreſſed by annexing a point, thus (.) See the articles TIME, CHARACTER, &c.

The antients had alſo their modi melopœi, as dithyrambic, comic, and tragic; ſo called from their expreſſing the ſeveral affections of the mind.

MODEL, in a general ſenſe, an original pattern, propoſed for any one to copy or imitate.

This word is particularly uſed, in building, for an artificial pattern made in wood, ſtone, plaſter, or other matter, with all its parts and proportions, in order for the better conducting and executing ſome great work, and to give an idea of the effect it will have in large. In all great buildings, it is much the ſureſt way to make a model in relievo, and not to truſt to a bare deſign or draught. There are alſo models for the building of ſhips, &c. and for extraordinary ſtair-caſes, &c.

They alſo uſe models, in painting and ſculpture, whence, in the academies, they give the term model to a naked man or woman, diſpoſed in ſeveral poſtures to give an opportunity to the ſcholars to deſign him in various views and attitudes.

MODENA, a dutchy of Italy, bounded by Mantua on the north, by Romania on the eaſt, by Tuſcany and Lucca on the ſouth, and by Parma and the territory of Genoa on the weſt.

MODENA, the capital of the dutchy of that name,

name, situated in 11° 20′ east long. and 44° 45′ north lat.

MODERATA MISERICORDIA, in law, a writ that lies where one is amerced in a court baron, or other court, not being of record, for any fault or transgression beyond the quality and quantity of that offence; and is directed to the lord of the court or his steward, commanding them to take a moderate amercement of the party.

MODERATOR, in the schools, the person who presides at a dispute, or in a public assembly: thus the president of the annual assembly of the church of Scotland, is stiled moderator.

MODERATOR-RING, in anatomy, is used by Valsalva for that ring which the muscles of the eye make round the optic nerve at the bottom of the orbit.

MODERN, in a general sense, something new, or of our time, in opposition to what is antique or antient.

MODICA, a town of Sicily, in the province of Noto, twenty-five miles south of Syracuse.

MODIFICATION, in philosophy, that which modifies a thing, or gives it this or that manner of being.

Quantity and quality are accidents which modify all bodies. According to Spinosa's system all the beings that compose the universe are only so many different modifications of one and the same substance; and it is the different arrangement, and situation of their parts, that make all the difference between them.

MODILLIONS, in architecture, ornaments in the corniche of the ionic, corinthian, and composite columns. See IONIC, CORINTHIAN and COMPOSITE.

The modillions are little inverted consoles, or brackets, in form of an S under the soffit of the corniche, seeming to support the projecture of the larmier; tho' in reality they are no more than ornaments. See plate CLXXXI. fig. 3.

They ought always to be placed over the middle of the column. They are particularly affected in the corinthian order, where they are usually enriched with sculpture. Their proportions ought to be so adjusted, as to produce a regularity in the parts of the soffits. The intermodillions, *i. e.* the distances between them, depend on the inner columns, which oblige the modillions to be made of a certain length and breadth, in order to render the intervals perfect squares, which are always found to have better effects than parallelograms. To this it must be added, that in adjusting the modillions, care should be taken that they have such a proportion as that when the orders are placed over one another, there be the same number in the upper order as in the lower, and that they fall perpendicularly over one another.

Modillions are also used under the corniches of pediments, though Vitruvius observes that they were not allowed in his time, because modillions were intended to represent the ends of rafters. Daviler rather takes them for a kind of inverted consoles, or corbels. The modillion is sometimes called a mutule, though custom has introduced a little difference between the idea of a modillion and a mutule; the mutule being peculiar to the doric order, and the modillions to the higher orders. In the ionic and composite orders, modillions are more simple, having seldom any ornaments except sometimes a single leaf underneath. M. Le Clerc observes on the corinthian order, that it is usual to have a leaf that takes up their whole breadth, and almost their whole length too; but he is of opinion, that the modillions would be more graceful, if this leaf was less both in length and breadth.

MODIOLUS, in surgery, an instrument otherwise called a trepan. See the article TREPAN.

MODIUS, in antiquity, a kind of dry measure, in use among the Romans, for several sorts of grain. See MEASURE.

MODO ET FORMA, *in manner and form*, among lawyers, are words of art frequently used in pleadings, *&c.* and particularly in a defendant's answer, wherein he denies to have done what is laid to his charge in manner and form, as affirmed by the plaintiff.

MODON, a city and port-town of european Turky, situated in the Morea, twenty miles west of Coron: east long. 21° 30′, north lat. 37°.

MODULATION, in music, the art of keeping in, or changing the mode or key. See the articles KEY and MODE.

Under this term is comprehended, the regular progression of several parts, thro' the sounds that are in the harmony of any particular key, as well as the proceeding naturally and regularly from one key to another; the rules of modulation, in the first sense, belonging to harmony and melody. See the articles HARMONY and MELODY.

We ſhall here only add a few words with regard to the rules of modulation, in the latter ſenſe. As every piece muſt have a particular key, and ſince the variety ſo neceſſary in muſic to pleaſe and entertain forbids the being confined to one key, and that therefore it is not only allowable but neceſſary to modulate into, and make cadences on ſeveral keys having a relation and connection with the principal key, it muſt be conſidered what it is that conſtitutes a connection between the harmony of one key and that of another, that it may be hence determined into what keys the harmony may be conducted with propriety.

As to the manner in which modulation from one key to another is performed, ſo that the tranſition may be eaſy and natural, it is not eaſy to fix any preciſe rules; for though it is chiefly performed by the help of the ſeventh greater of the key, into which the harmony is to be changed, whether it be ſharp or flat, yet the manner of doing it is ſo various and extenſive, as no rules can circumſcribe. A general notion of it may be conceived under the following terms: the ſeventh greater in either a ſharp or flat key, is the third greater to the fifth of the key by which the cadence is chiefly performed, and by being only a ſemitone major below the key, is thereby the moſt proper note to lead into it, which it does in the moſt natural manner imaginable, inſomuch that the ſeventh greater is never heard in any of the parts, but the ear expects the key ſhould ſucceed it: for whether it be uſed as a third or a ſixth, it always affects us with ſo imperfect a ſenſation, that we naturally expect ſomething more perfect to follow it, which cannot be more eaſily and ſmoothly accompliſhed than by the ſmall interval of a ſemitone major to paſs into the perfect harmony of the key. Hence it is that the tranſition into any key is beſt effected by introducing its ſeventh greater, which ſo naturally leads to it.

MODULE, in architecture, a certain meaſure or bigneſs, taken at pleaſure, for regulating the proportions of columns, and the ſymmetry or diſpoſition of the whole building. Architects generally chooſe the ſemi-diameter of the bottom of the column for their module, and this they ſub-divide into parts or minutes. The module of Vignola, which is a ſemi-diameter, is divided into twelve parts in the tuſcan and doric, and into eighteen for the other orders. The module of Palladio, Scamozzi, M. Cambray, Deſgodetz, Le Clerc, *&c.* which is alſo equal to the ſemi-diameter, is divided into thirty parts or minutes in all the orders. The whole height of the column is divided by ſome into twenty parts for the doric, twenty-two and a half for the ionic, twenty-five for the roman, *&c.* and one of theſe parts is made a module, to regulate the reſt of the building by. There are two ways of determining the meaſures, or proportions of buildings. The firſt is by a fixt ſtandard-meaſure, which is uſually the diameter of the lower part of the column, called a module, ſub-divided into ſixty parts called minutes. In the ſecond there are no minutes, nor any certain or ſtated diviſion of the module, but it is divided occaſionally into as many parts as are judged neceſſary; thus the height of the attic baſe, which is half the module, is divided either into three, to have the height of the plinth, or into four, for that of the greater torus; or into ſix, for that of the leſſer. Both theſe manners have been practiſed by the antient as well as the modern architects, but the ſecond, which was that chiefly uſed among the antients, is, in the opinion of M. Perrault, the preferable. As Vitruvius has leſſened his module in the doric order, which is the diameter of the lower part of the other orders, and has reduced that great module to a mean one, which is the ſemi-diameter, the module is here reduced to the third part, for the ſame reaſon, *viz.* to determine the ſeveral meaſures without a fraction. For in the doric order, beſides that the height of the baſe, as in the other orders, is determined by one of thoſe mean modules, the ſame module gives likewiſe the height of the capital, architrave, triglyphs, and metopes. But our little module, taken from the third of the diameter of the lower part of the column, has uſes much more extenſive; for by this the height of the pedeſtals or columns and entablatures in all the orders are determined without a fraction. As then the great module or diameter of the column has ſixty minutes, and the mean module, or half the diameter, thirty minutes, our little module has twenty.

MODUS DECIMANDI, in law, is where money, land, or other valuable conſideration has been given, time out of mind, to the miniſter or parſon of any certain place in the room of tithes. A clergy-

man may sue in a spiritual court for a modus decimandi; yet if the modus is denied there, or a custom is to be tried, the trial thereof belongs to the courts of common law. When lands are converted to other uses, as in the case of hay-ground turned into tillage, the modus may be discharged, and the tithes paid again in kind.

MOEDORE, or MOIDORE. See the article MOIDORE.

MOHERINGIA, MOSSY CHICKWEED, in botany, a genus of the octandria-digynia class of plants, the flower of which is composed of four short, undivided petals; and its fruit is a subglobose capsule, with one cell, in which are contained numerous roundish seeds.

It is called by some alsine muscosa.

MOFFAT, a village in the shire of Annandale, thirty-six miles south-west of Edinburgh; famous for its mineral wells, one of which is used for bathing, and the water of the other is taken inwardly. These waters are of great service in gripings of the guts, colics, and pains in the stomach. Those who are troubled with obstructions, rheumatic pains and aches, find great relief both from bathing and drinking; nor is this water a less sovereign remedy in scorbutic cases, and the king's evil. These wells, in the opinion of Dr. Plummer, professor of medicine in the university of Edinburgh, owe their virtues to a sulphureous principle.

MOGULS, or MONGULS, hoards or tribes of vagrant Tartars, on the north of India, from whom the moguls or sovereigns of India, as well as of the Usbec-Tartars, are descended.

MOHAIR, in commerce, the hair of a kind of goat, frequent about Angoura, in Turky; the inhabitants of which city are all employed in the manufacture of camblets, made of this hair. See the articles HAIR and CAMBLET.

Some give the name mohair to the camblets or stuffs made of this hair; whereof the unwatered kind pays $6\frac{93}{100}$ d. per yard on importation, and draws back, on exportation, $6\frac{7\frac{1}{2}}{100}$ d. The watered sort pays on importation $11\frac{55}{100}$ d. per yard, and draws back, on exportation, $10\frac{12\frac{1}{2}}{100}$ d. And that made of half hair, half silk, pays, on importation, 2 s. $10\frac{35}{100}$ d. per yard, and draws back, on exportation, 2 s. $7\frac{1}{2}$ d.

MOHAIR-SHELL, in natural history, a species of voluta. See VOLUTA.

MOHATS, a town of Lower Hungary, situated on the Danube: east long. 20°, north lat. 46° 16′.

MOHAWK-COUNTRY, a part of North America, inhabited by one of the five nations of the Iroquois, in alliance with and situated between the province of New York and the lake Ontario, or Frontignac.

MOHILA, one of the Comora-islands in the Indian ocean, situated between Madagascar and the continent of Africa: east long. 43° 30′, south lat. 12°.

MOHILOW, or MOGILOF, a city of Poland, in the province of Lithuania, situated fifty miles south of Orsa.

MOIDORE, or MOEDORE, a portuguese gold-coin. See the article COIN.

MOIETY, *medietas*, the half of any thing. See the article MEDIETAS.

MOINEAU, in fortification, is a flat bastion raised between two other bastions, when a re-entering angle before a curtain is too long. The moineau is commonly joined to the curtain, but it is sometimes separated from it by a foss, in which case it is called a detached bastion. The moineau is not raised so high as the works of the place, because it ought to be exposed to the fire of the place in case the enemy should lodge themselves in it.

MOISTURE, a term sometimes used to denote animal fluids, the juices of plants, or dampness of the air or other bodies.

Radical MOISTURE, among physicians, signifies a vital fluid, which nourishes and maintains life, as oil does a lamp. However, Dr. Quincy observes, that such a fluid is a mere chimera, unless we thereby mean the mass of blood. See the article BLOOD.

MOLA, in geography, a town of Italy, seven miles east of the city of Barri, in the kingdom of Naples.

MOLA, in anatomy, the same with patella. See the article PATELLA.

MOLA, the SUN-FISH, in ichthyology, a species of ostracion, of a compressed, roundish figure, with four holes on the head.

This is a very singular fish, weighing often more than an hundred pounds: its figure, at first sight, more resembles the head of some large fish, cut off from the body, than that of a complete animal.

MOLA, a mole, in medicine. See the article MOLE.

MOLARES, or Dentes molares, in anatomy, the large teeth called in english grinders. See the article Tooth.

MOLARIS lapis, the mill-ſtone. See the article Mill-stone.

MOLASSES, or Molosses. See the article Molosses.

MOLD, or Mould. See Mould.

MOLDAVIA, a province of european Turky, ſeparated from Poland by the river Neiſter.

MOLE, *talpa*, in zoology, makes a genus of quadrupeds, of the order of the feræ, thus characterized: the feet are formed like hands, and calculated for digging; and it has no external ears.

Of this genus there are two ſpecies. 1. The common mole, a well known little animal, of a bluiſh-black colour, very miſchievous to the farmers, by throwing up the ground of their paſtures. 2. The pointed tail-leſs mole, ſomewhat larger than the common kind: it is of a mixed colour, in which a purpliſh and yellowiſh tinge ſeem the prevailing ones: it is a native of Aſia, and lives under ground, like the common mole.

Mole Cricket, the ſame with gryllo talpa. See Gryllo Talpa.

Mole, *mola carnea*, in medicine, a maſs of fleſhy matter, of a ſpherical figure, generated in the uterus, or womb, and ſometimes miſtaken for a child. Its ſize is various, from that of a large nut to that of a fœtus. Some moles are ſoft and ſpungy, and others membranous, with a cavity in the middle. Sometimes they are filled with ſerous matter, and ſometimes with hydatides.

The ſymptoms of a mole, at firſt, are like thoſe of a real pregnancy; but afterwards they vary, for the woman feels a dull heavy weight like that of a ball of lead; her belly being round and ſpherical, without any motion like that of a living fœtus.

The mole itſelf threatens no danger, all the difficulty lying in being delivered of it. Some women are troubled with them for ſeveral years, and others all their life, without any other inconvenience than uneaſineſs and weight.

The cure conſiſts in expelling the mole; for which purpoſe the aſſiſtance of an expert midwife or ſurgeon becomes neceſſary. If the mouth of the uterus ſhould be too ſtrongly contracted to admit the hand of the operator, it is proper to excite the woman's throws by briſk cathartics and ſtrong clyſters; while the os uteri, and parts adjacent, are in the mean time gradually relaxed by the application of emollient fomentations, &c. which done, one or two of the fingers are to be firſt gently inſinuated, and then the whole hand by degrees, in order to extract the mole, as directed for the fœtus. See the article Delivery.

If the mole adheres to the uterus, as it frequently does, it is to be gently ſeparated before extraction; and if it be too large to be got out entire, it may be carefully ſeparated and extracted in pieces, either with the fingers, or a falciform hook. To conclude, ſays Heiſter, if a mole does not occaſion any bad ſymptoms, or uneaſineſs in the mother, and its extraction appears difficult, no violence ſhould be uſed; ſince we have many inſtances of moles retained in the uterus, without any great detriment to the patient, as long as they lived.

Mole, in geography, a river in Surrey, ſo called from its running, for part of its courſe, under ground.

Mole, *moles*, is alſo a maſſive work of large ſtones laid in the ſea by means of cofferdams; extending before a port, either to defend the harbour from the impetuoſity of the waves, or to prevent the paſſage of ſhips without leave.

Mole, *moles*, in antiquity, a kind of mauſoleum, in form of a round tower, built upon a ſquare baſe.

MOLINA, a city of Spain, eighty five miles north-eaſt of Madrid.

MOLINE, or Cross-moulin, in heraldry, the ſame with that called fer de moulin. See the article Fer de Moulin.

MOLISE, a city of Italy, fifty miles north-eaſt of the city of Naples.

MOLLEN, a town of Lower Saxony, fifteen miles north of Lawenberg.

MOLLUGO, bastard-madder, in botany, a plant of the triandria-trigynia claſs, without any flower petals: its fruit is a capſule of a ſomewhat oval figure, with three cells; in each of which there are a number of kidney-ſhaped ſeeds.

It is ſaid to have the ſame medicinal virtues as madder. See Madder.

MOLOSSES, in commerce, the thick fluid matter remaining after the ſugar is made, reſembling ſyrup. See Sugar.

In Holland moloſſes are much uſed in the manufacture of tobacco, and by the poor people for ſugar. A brandy is alſo diſtilled from them, but it is ſaid to be unwholeſome. See the articles Brandy, Distillation, &c.

Moloffes imported from the britifh plantations, pay per ton 2 l. 11 s. 4 d. and draw back, on exportation, 2 l. 5 s. Moloffes from any other place, pay, on importation, 10 l. 1 s. 4 d. per ton; and draw back, on exportation, 9 l. 15 s.

MOLOSSUS, in greek and latin poetry, a foot compofed of three long fyllables, as *delectant*.

MOLTA, or MOLTURA, a toll or duty formerly paid by vaffals to their lord, for grinding their corn in his mill.

MOLTING, the change of feathers, hairs, or horns, in birds and beafts. See the article MEWING.

MOLUCCA-ISLANDS, five iflands in the Indian ocean, the largeft of which is fcarce thirty miles round; they are called Bachian, Machian, Motyr, Ternate, and Tydor; they produce fago, oranges, lemons, and fome other fruits; but what is peculiar to thefe iflands, is their producing cloves. They are fubject to the Dutch, and are fituated in 125° of eaft longitude, and between 50′ fouth, and 2° north latitude.

MOLUCCA-BEANS, *moluccella*, in botany, a genus of the didynamia-gymnofpermia clafs of plants, the flower of which is monopetalous and labiated; the upper lip being entire, and the lower one trifid: the feeds are turbinated, and contained in the bottom of the cup.

MOLWITZ, a town of Silefia, in the kingdom of Bohemia: eaft long. 16° 45′, north lat. 50° 26′.

MOLY, in botany, a fpecies of allium, or garlic.

MOLYBDIA, in natural hiftory, the name of a genus of cryftals, of a cubic form, or compofed of fix fides, at right angles, like a die. See CRYSTAL.

Of this genus there are three known fpecies. 1. A colourlefs one, compofed of extremely fine crufts. This is found in many parts, both of this and other kingdoms, where there are lead-mines; and tho' naturally colourlefs, is fometimes tinged with a red, green, or blue. 2. A dull one with thicker crufts, fometimes whitifh, and fometimes coloured to a yellowifh or other hue. This is found in the lead-mines of Yorkfhire, and fome other places. And 3. A dull bluifh white one, with very thick crufts. This is very frequent in the lead-mines in Derbyfhire, and is generally found in large clufters.

MOMBAZA, or MONBASA, an ifland and city on the eaft coaft of Africa, oppofite to the country of Mombaza, in Zanguebar: eaft long. 48°, north lat. 4°.

MOMBAZA, a fub-divifion of Zanguebar, fubject to the Portugueze.

MOMENT, in the doctrine of time, an inftant, or the moft minute and indivifible part of duration. See TIME.

Strictly fpeaking, however, a moment ought not to be confidered as any part of time, but only as the termination or limit thereof.

MOMENT, in the doctrine of infinites, denotes the fame with infinitefimal. See the article INFINITESIMAL.

Leibnitz, and other foreigners, call thefe moments differences. See CALCULUS DIFFERENTIALIS.

MOMENTUM, in mechanics, fignifies the fame with impetus, or the quantity of motion in a moving body; which is always equal to the quantity of matter, multiplied into the velocity; or, which is the fame thing, it may be confidered as a rectangle under the quantity of matter and velocity. See MOTION.

MOMORDICA, the WILD CUCUMBER, in botany, a genus of the monoecia-fyngenefia clafs of plants, with a monopetalous flower, divided into five fegments: the fruit is an apple, burfting open with great elafticity, and containing a number of compreffed feeds.

This genus comprehends the momordica and luffa of Tournefort, and the elaterium of Boerhaave; and indeed the elaterium of the fhops, a violent purge, is the fruit of this plant.

MONA, an ifland in the Baltic, fouthweft of the ifland of Zealand, fubject to Denmark: eaft long. 12° 30′, north lat. 55° 20′.

MONACO, a port-town of Italy, in the territory of Genoa: eaft long. 7° 18′, north lat. 43° 53′.

MONADELPHIA, in botany, a clafs of plants, the fixteenth in order, fo called becaufe the ftamina of the flowers are fo interwoven as to form one body; or rather, becaufe the ftamina are connected, or coalefce at the bafe. See BOTANY.

To this clafs belong the mallow, alcea, althæa, and hibifcus. See the article MALLOW, &c.

MONAGHAN, a county of Ireland, in the province of Ulfter, bounded by Tyrone, on the north; by Armagh, on the eaft; by Cavan and Louth, on the fouth; and by the county of Farmanagh, on the weft.

MONANDRIA, in botany, a clafs of plants,

plants, the firft in order, with only one ftamen, or male part in each flower.

The monandria are fubdivided into two orders, which are denominated monandria-monogynia, and monandria-digynia, according as they contain one or two ftyles. See the article STYLE.

To this clafs belong canna, boerhaavia, &c. See the article CANNA, &c.

MONARCHY, a government in which the fupreme power is invefted in a fingle perfon. There are feveral kinds of monarchies, as where the monarch is invefted with an abfolute power, and is accountable to none but God. It is an error to fuppofe, that a defpotic or abfolute monarch is a folecifm in politics, and that there can be none fuch legally; for the contrary is true, and that in different parts of the world, and from various principles. In China it is founded on paternal authority, and is the bafis of the government; in Turky, Perfia, Barbary, and India, it is the effect of religion; and in Denmark, the king is legally abfolute by the folemn furrender which the people made to his predeceffor of their liberties. Another kind of monarchy is that which is limited, where the fupreme power is virtually in the laws, though the majefty of government, and the adminiftration, is vefted in a fingle perfon. Monarchies are alfo either hereditary, where the regal power defcends immediately from the poffeffor to the next heir by blood; or elective, where the choice depends upon all who enjoy the benefit of freedom, as in Poland; or upon a few perfons in whom the conftitution vefts the power of election, as in the german empire. See the articles KING and GOVERNMENT.

MONARDA, in botany, a genus of the diandria-monogynia clafs of plants, with a monopetalous flower, the limb of which is ringent: the feeds are four in number, roundifh, and contained in the bottom of the cup.

MONASTERY, a convent, or houfe built for the reception and entertainment of monks, mendicant friars, or nuns, whether it be an abbey, priory, &c.

Monafteries are governed by different rules, according to the different regulations prefcribed by their founders. The firft regular and perfect monafteries were founded by St. Pachomius, in Egypt: but St. Bafil is generally confidered as the great father and patriarch of the eaftern monks; fince in the fourth century he prefcribed rules for the government of the monafteries, to which the anachorets and coenobites, and the other antient fathers of the defarts, fubmitted: in like manner St. Benedict was ftiled the patriarch of the weftern monks; he appeared in Italy towards the latter end of the fifth century, and publifhed his rule, which was univerfally received throughout the weft. St. Auguftin being fent into England by St. Gregory the pope, in the year 596, to convert the Englifh, he at the fame time introduced the monaftic ftate into this kingdom, which made fuch progrefs here, that within the fpace of two hundred years, there were thirty kings and queens who preferred the religious habit to their crowns, and founded ftately monafteries, where they ended their days in folitude and retirement.

MONASTIC, fomething belonging to monks. See the article MONK.

MONBRISON, or MONTHRISON, a town of France, in the province of Lyonois, thirty-feven miles fouth-weft of Lyons.

MONCON, a town of Spain, in the province of Arragon, fifty miles north-eaft of Saragoffa.

MONCONTOUR, a town of France, in the province of Britany, thirty miles fouth-weft of St. Malo.

MONDAY, *dies lunæ*, the fecond day of the week, fo called as being antiently facred to the moon, *q. d.* moon-day. See the articles DAY and WEEK.

MONDEGO, a river of Portugal, which runs through the province of Beira, and falls into the Atlantic ocean thirty miles below Coimbra.

MONDENEDO, a city of Spain, in the province of Galicia, feventy miles north-eaft of Compoftella.

MONDIDIER, a town of France, in the province of Picardy, eighteen miles fouth of Amiens.

MONDOVI, a city of Italy, in the territory of Piedmont: eaft long. 7° 55′, north lat. 44° 35′.

MONEMUGI, a country in the fouth of Africa, fituated between Angola and Zanguebar.

MONEY, *moneta*, a piece of matter, commonly metal, to which public authority has affixed a certain value and weight, to ferve as a medium in commerce.

The æra of the invention of money is not eafy to be fettled. There is no room to doubt but that in the earlieft ages the ordinary way of traffic among men, was by

by trucking or exchanging one commodity for another; but in course of time it was found necessary, in the way of commutative justice, to have some common measure or standard, according to which all things should be estimated. See the article EXCHANGE.

Money is usually divided into real and imaginary. Real money includes all coins, whether of gold, silver, copper, or the like; such as guineas, crowns, pistoles, pieces of eight, ducats, &c. for an account of which we refer the reader to the article COIN, where we have given tables of the most remarkable coins, both antient and modern, with their values in english money. See also GUINEA, CROWN, PISTOLE, &c.

Imaginary money, or money of account, is that which has never existed, or, at least, which does not exist in real species; but is a denomination invented or retained to facilitate the stating of accounts, by keeping them still on a fixed footing, not to be changed like current coins, which the authority of the sovereigns sometimes raises or lowers, according to the exigencies of the state, of which kinds are pounds, livres, marks, maravedies, &c. See POUND, &c.

Under this division of money we have endeavoured to give an account of all the most remarkable imaginary species in the several trading places of note in the world; and having made our collection from various authors, we have corrected their errors, which were many, with all possible accuracy. And here it is necessary to observe, that to avoid repetitions, we are obliged to refer the reader to the article COIN, for the stating the proportion of the different european monies of account to sterling money; some of this last species of most nations in Europe being given there, with its value in english money, which may serve to settle the several proportions with the English.

English MONEY *of account*, is the pound, shilling, and pence; the first and last being imaginary money, and exchanges calculated in one of them two: the pound contains twenty shillings, and the shilling twelve pence.

Scotch MONEY *of account*, is the pound, shilling, and penny; the pound containing twenty shillings, being equivalent to one shilling and eight-pence english; and the shilling containing twelve pennies, equal to a penny english. There is also among them an account of marks, the mark being equivalent to one shilling 1⅛ penny english: of this last kind they had formerly a silver coin. See COIN.

French MONEY *of account*, is in livres, sols, and deniers, of which twelve deniers make a sol, and twenty sols a livre: their exchange is by the crown of three livres, or sixty sols.

Dutch MONEY *of account*, is kept, at Amsterdam and Rotterdam, the two chief trading places, in guilders, stivers, and penins; so that though goods are sold for other species, such as livre-de-gros, &c. yet all are reduced to the above denominations for the entries into their books. The exchanges are made with us in so many shillings to a pound sterling, though in most other places in deniers-de-gros.

Spanish MONEY *of account*, is at Cadiz kept in rials of plate and its fractions; at Castile, in maravedies; at Valencia, in livres or dollars, sueldos and dineros; of which last, twelve make a sueldo, and twenty sueldos a livre or dollar. Seventeen quartos at Cadiz and Castile make two rials vellon, which is now an imaginary coin, though formerly it was the principal one of the kingdom. A maravedie is another imaginary specie, of which seventeen is reckoned to a rial vellon. The ducat is also a fictitious coin of eleven rials of plate in purchases, sales, and other mercantile transactions, except in exchanges, when it is valued at eleven rials of plate, and one maravedie, or 375 maravedies.

Portuguese MONEY *of account*, is kept in reas, or res, making a separation at every hundred, thousandth, &c. 800 reas go to a moidore.

German and Swiss MONEY *of account*. At Coningsberg, Elbing, and Dantzick, accounts are kept in rixdollars and gros, or in polish guilders, gros, and deniers, or penins. They exchange on Amsterdam in polish gros for a livre-de-gros of six gilders current money of Amsterdam, and on Hamburgh for the rixdollar. At Lubeck, accounts are kept in marks, schellings, and deniers or penins-lubs, in which their exchanges are made. At Breslaw, accounts are kept in rixdollars and silver gros and penins; in the first of which species exchanges are made on Amsterdam for a certain number of stivers, bank-money, and on Hamburg for rixdollars of Breslaw, against rixdollars of Hamburg bank. At Hamburg, accounts

counts are kept in marks, schellings, and deniers-lubs bank-money, by those who have cash in the bank; but by those who have not, their books are generally kept in rixdollars, schellings, and denier current money. At Bremen, accounts are kept in rixdollars and gros, and it exchanges on Amsterdam rixdollars of seventy-two gros, for rixdollars of fifty stivers banco. At Leipsic and Naumbourg, accounts are kept in rixdollars, crowns, gros, and penins. At Berlin, and in all this kingdom, accounts are kept in guilders, gros, and penins. At Zurich, accounts are kept in rixdollars, creutzers, and hellers; reckoning their rixdollars (worth about 4 s. 6 d. sterling) at 108 of their creutzers. At Frankfort on the Maine, and Hanaw, accounts are kept in rixdollars and creutzers. At Vienna accounts are kept in guilders, creutzers, and penins, reckoning eight penins to a creutzer, and sixty creutzers to a guilder. At Nuremberg and Augsbourg, accounts are kept in guilders, creutzers, and hellers; at Liege, in livres, sols, and deniers.

In the canton of St. Gall, in Switzerland, accounts are kept in guilders, creutzers, and penins; or under the same denomination with the coins of the empire. In the canton of Basil, accounts are variously kept, some in rixdollars, schellings, and deniers; some in livres, schellings, and deniers; some in rixdollars, creutzers, and penins; and some in guilders, creutzers, and penins.

Italian MONEY *of account.* In the cities of Genoa and Novi, accounts are kept in livres, soldi, and denari; or in dollars of 100 soldis. At Milan accounts are kept in livres, soldis, and denari, to be counted like pounds, shillings, and pence, *viz.* twelve denaris to a soldi, *&c.* At Rome, accounts are kept in crowns, julios, and bajoches, or grains and quartrins; the crown is divided into ten julios, and the julio into ten bajoches. At Leghorn, accounts are generally kept in dollars, soldi, and denari. At Florence, they keep their books and accounts in crowns, soldi, and denari, picoli or current money. At Naples, accounts are kept in ducats, florins, and grains. The accounts in Sicily are kept the same as at Naples. At Lucca they keep their accounts in crowns, livres, soldi, and denari; the crown is worth 7 livres 10 soldi; the livre, 20 soldi; and the soldi, 12 denari. At Venice, accounts are kept in livres, soldi, and denari, picoli, or current; but the bank-entries are in livres, soldi, and grosses: both the current and bank-ducats of Venice make 24 soldi, or 6 livres and four soldi. At Bologna, accounts are kept in livres, soldi, and denari; the livre being 20 soldi, and the soldi 12 denari. At Bergam, the money of account is the same as at Bologna, and its proportions the same. At Parma accounts are kept in crowns, soldi, and denari; the crown is 20 soldi, and the soldi 20 denari. At Modena and Mantua, accounts are kept in livres, soldi, and denari. In Savoy and Piedmont, accounts are kept in livres or lires, soldi, and quartrins. At Placentia, accounts are kept in crowns, soldi, and denari of mark; of which 12 denari make a soldi, and 20 soldi the crown. In the island of Sardinia, accounts are kept as in most parts of Italy, in livres, soldi, and denari. In the island of Malta, the money of account is the same with that of Sicily. In the island of Candia, the account is the same as at Venice.

Russian, Swedish, Danish, and Polish, MONEY *of account.* In the trading places of the russian empire, accounts are kept in roubles, grives, and moscosques, or in roubles and coppecks; 10 coppecks (each of which is equal to 2 moscosques) make a grive, and 100 coppecks, or 10 grives, is a rouble. In the kingdom of Sweden, accounts are kept in dollars, marks, and oorts; the dollar being worth 4 marks, and the mark 8 oorts. In Denmark, accounts are kept in marks and schellings: the rixdollar is worth six marks; the mark, 16 schellings; and the schelling, 3 penins. Accounts are kept at Bergen, and in other places in Norway, in danish rixdollars, marks, and schellings. In Poland, accounts are kept in guilders, gros, and deniers, of which 18 deniers make a gros, and 30 gros a guilder: they here keep accounts also in rixdollars and gros, reckoning 90 of the latter to one of the former. At Riga, accounts are kept in rixdollars and gros, the former of which species consists of 90 of the latter.

Turkish MONEY *of account.* The Turks, both in Europe, Asia, and Africa, account by purses, either of silver or gold (the last being only used in the seraglio) with half purses of gold, called also rizes: the purse of silver is equal to 1500 french livres, or about 65 l. sterling; and the half purse in proportion: the purse of

gold

gold is 15000 fequins, equal to 30000 french crowns, or about 3750 l. fterling: this is feldom ufed but for prefents to favourites, fo that a purfe fimply fignifies a purfe of filver, or 1500 livres. The merchants alfo ufe dutch dollars, called aftani or abouquels, with medins and afpers: the dollar is equal to 35 medins, and the medin to 3 afpers; the afper to a halfpenny fterling money.

Afiatic MONIES *of account* are as follow. In Perfia, they account by the taman (called alfo man and tumein) and dinar bifti; the taman is compofed of 50 abaffis, or 100 mamodies, or 200 chapes, or 10000 dinars; which, accounting the abaffi on the foot of 18 french fols, or the dinar on that of a denier, amounts to 3 l. 12s. 6 d. fterling the taman. They alfo account by larins, efpecially at Ormus, and on the coaft of the Perfian gulph: the larin is equivalent to 11 d. fterling; and on that footing is ufed alfo in Arabia, and through a great part of the Eaft-Indies.

Chinefe moneys of account are the pic, picol, and tael; which, though in effect weights, do likewife ferve as money of account, obtaining in Tonquin as well as China: the pic is divided into 100 catis, fome fay 125; the cati into 16 taels, each tael equal to one ounce two drachms: the picol contains 66⅔ caties; the tael is equivalent to 6 s. 8 d. fterling.

Japonefe moneys of account are the fchuites, cockiens, oebans or oubans, and taels: 200 fchuites are equal to 500 dutch pounds, the cockien equal to 10 low-country pounds, 1000 oebans make 45000 taels.

Mogul money of account: at Surat, Agra, and the reft of the eftates of the great Mogul, they ufe lacres, acrees, or leeths, implying one hundred thoufand; thus a lacre of rupees is 100000 rupees; the lacre being nearly on the footing of the tun of gold in Holland, and the million of France.

Monies of account of other iflands and coafts of India. Throughout Malabar, and at Goa, they ufe tangas, vintins, and pardos-xeraphin: the tanga is of two kinds, *viz.* of good and bad alloy; hence their cuftom is to count by good or bad money; the tanga of good alloy is better by one fifth than the bad, fo that 4 tangos good being allowed the pardos-xeraphin, there will be required 5 of the bad; 4 vintins good make a tanga likewife good; 15 barucos, a vintin; a good baruco is equal to a portuguefe ree, a french denier, or one thirteenth of a penny fterling. In the ifland of Java they ufe the fonta, fapacou, fardos, and catis; which laft money, together with the leeth or lacre, is much ufed throughout all the Eaft-Indies: the fonta is 200 caxas, or little pieces of that country, hung on a ftring, and is equal to eleven twelfths of a penny fterling: five fontas make the fapacou. The fardos equal to 2 s. 8 d. fterling; the cati contains 20 taels; the tael 6 s. 8 d. fterling. There are iflands, cities, and ftates of the Eaft-Indies, whofe monies of account are not here expreffed, partly becaufe reducible to fome of the above-mentioned, and partly becaufe we find no certain confiftent account of them.

African MONEY *of account.* From Cape Verd to the Cape of Good-hope, all exchanges and valuations of merchandize are made on the foot of the macoute and piece; which, though no monies of account (for thofe barbarians have no real monies, and therefore need no imaginary ones to eftimate them by) yet ferve in lieu thereof. At Loango de Boirie, and other places on the coaft of Angola, the eftimations are made by macoutes; and at Malimbo and Cabindo, on the fame coaft, the negroes reckon by pieces: among the firft the macoute is equal to 10 pieces; ten macoutes make 100, which likewife gives us a kind of imaginary money to eftimate any purchafe, exchange, *&c.* they fix on the one fide the number of macoutes required; *e. gr.* for a negro; fo that there are feveral bargains made for one; fuppofe, for inftance, the flave to be fixed at 3500 pieces, this amounts to 350 macoutes; to make up this number of macoutes in merchandize, they fix the price of each in macoutes. Two flemifh knives, *ex. gr.* are accounted one macoute; a copper-bafon, 2 lb. weight, three; a barrel of gun-powder, three, *&c.* For the piece, it ferves in like manner to eftimate the value of goods, duties, *&c.* on either fide: thus the natives require 10 pieces for a flave; and the europeans put, for inftance, a fufee at 1 piece, a piece of falampours at 4 pieces, *&c.* The cities of Barbary and Egypt, whither the europeans traffic, reckon much after the fame manner as in the Levant and the dominions of the grand fignior; for the reft, through that vaft extent of coaft where we trade for negroes, gold-duft, elephant's teeth, wax, leather, *&c.* either the miferable inhabitants

bitants do not know what money of account is, or, if they have any, it is only what ſtrangers, ſettled among them, have introduced.

Monies *of account in America*. Here they have no money of their own; the reſpective monies of account of the Europeans, who have made ſettlements there, being eſtabliſhed among them.

Monies *of account among the antients*. Grecian monies of account. The Greeks reckoned their ſums of money by drachmæ, minæ, and talenta: the drachma was equal to 7¾ d. ſterling; 100 drachmæ made the mina, equal to 3 l. 4 s. 7 d. ſterling; 60 minæ made the talent, equal to 193 l. 15 s. ſterling; hence 100 talents amounted to 19375 l. ſterling.

The mina and talent indeed were different in different provinces: the proportions in attic drachms are as follows; the ſyrian mina contained 25 attic drachms; the ptolemaic, 33⅓; the antiochic and eubæan, 100; the babylonic, 116; the greater attic and tyrian, 133⅓; the æginean and rhodian, 166⅔; the ſyrian talent contained 15 attic minæ, the ptolemaic 20, the antiochic 60, the eubæan 60, the babylonic 70, the greater attic and tyrian 80, the æginean and rhodian 100.

Roman monies of account were the ſeſtertius and ſeſtertium: the ſeſtertius was nearly equal to 2d. ſterling; 1000 of theſe made the ſeſtertium, equal to 8l. 1s. 5½d. ſterling; 1000 of the ſeſtertia made the decies ſeſtertium (the adverb *centies* being always underſtood) equal to 8072 l. 18s. 4 d. ſterling; the decies ſeſtertium they alſo called the decies centena millia nummum. Centies ſeſtertium, or centies H. S. were equal to 80729 l. 3 s. 4 d. Millies H. S. were equal to 807291 l. 13 s. 4 d. Millies centies H. S. equal to 888020 l. 16 s. 8 d.

Falſe, or *Baſe* Money, is either that ſtruck by an unqualified perſon, and of unſtatutable metals; or that which has loſt of its weight, either by being clipped on the corners, or filed on the edges; or, laſtly, by having ſome of its ſurface eaten off, if gold, by aqua regia; if ſilver, by aqua fortis. Another kind of baſe money, is that made of pieces of iron, copper, or other metal, covered on each ſide with a thin plate or leaf of gold or ſilver, neatly ſoldered and joined round the edges, and ſtruck, like other coin, with figures, legends, &c.

MONEYERS, Moneyors, or Moniers, officers of the mint, who work and coin gold and ſilver money, and anſwer all waſte and charges. See Mint.

MONFORTE, the name of two towns in Portugal, the one in the province of Alentejo, and the other in that of Beira.

MONGUL, or Mogul, a part of Tartary, lying eaſt of India and Perſia.

MONIKEDAM, a town of the united Netherlands, in the province of Holland, eight miles north-eaſt of Amſterdam.

MONITORY letters, are letters of warning and admonition, ſent from an eccleſiaſtical judge, upon information of ſcandals and abuſes, within the cognizance of his court.

MONK, a perſon who wholly dedicates himſelf to the ſervice of religion, in ſome monaſtery, under the direction of ſome particular ſtatutes and rules.

The moſt probable account of the original of the monks is, that in the decian perſecution, in the middle of the IIId. century, many perſons in Egypt, to avoid the fury of the ſtorm, fled to the neighbouring deſarts and mountains, where they not only found a ſafe retreat, but alſo more time and liberty to exerciſe themſelves in acts of piety and divine contemplations; which ſort of life became ſo agreeable, that when the perſecution was over, they refuſed to return to their habitations again, chooſing rather to continue in thoſe cottages and cells, which they had made for themſelves in the wilderneſs. From that time to the reign of Conſtantine, monachiſm was confined to the hermits or anachorets, who lived in private cells in the wilderneſs: but when Pachomius had erected monaſteries, other countries preſently followed the example. See the article Monastery.

The manner of admiſſion to the monaſtic life was uſually by ſome change of habit, not to ſignify any religious myſtery, but only to expreſs their gravity and contempt of the world. Long hair was always thought an indecency in men, and favouring of ſecular vanity, and therefore they polled every monk at his admiſſion, to diſtinguiſh him from ſeculars; but they never ſhaved them, leſt they ſhould look like the prieſts of Iſis. St. Jerom ſpeaking of the habits of the monks, intimates that it differed from that of others only in this, that it was cheaper, coarſer, and meaner raiment. We read of no ſolemn vow, or profeſſion, required at their admiſſion; but they underwent a triennial probation, during which time they were inured

inured to the exercifes of the monaftic life. If, after that time was expired, they chofe to continue the fame exercifes, they were then admitted, without any farther ceremony, into the community. As the monafteries had no ftanding revenues, all the monks were obliged to maintain themfelves by their daily labour: they had no idle mendicants among them, but looked upon a monk who did not work, as a covetous defrauder. Every ten monks were fubject to one, who was called the decanus, or dean, from his prefiding over ten; and every hundred had another officer called centenarius, from his prefiding over an hundred; and above thefe were the fathers of the monafteries, alfo called abbots. The bufinefs of the deans was to exact every man's daily tafk, and carry it to the fteward, who gave a monthly account of it to the abbot. See the article ABBOT.

For a particular account of the prefent monaftic orders, fee AUGUSTINS, BENEDICTINES, CARMELITES, DOMINICANS, FRANCISCANS, &c.

MONK-FISH, *fquatina*. See SQUATINA.

MONK-SEAM, among failors, is the fewing the edges or felvedges of fails together, over one another on both fides, to make it the ftronger.

MONKEY, *fimia*, in zoology, a numerous genus of quadrupeds of the order of the anthropomorpha, or quadrupeds that refemble the human figure: their face is naked; the claws are rounded and flattifh, in fome degree like the nails on the human hand; and they have both an upper and lower eye-lid.

Of all the animals of the monkey-kind, the fatyr refembles mankind moft; its face is naked, and is very like that of an aged and not handfome man; it has no tail, and in other refpects greatly refembles the human form. The moft like, next to this, is the oran-outang, or black-faced monkey, called the favage; and the next to this is the baboon, or whifkered fimia, with a fhort tail: the reft of the monkeys, of which there are a great many kinds, differing widely both in fize and figure, have neverthelefs fomething of the human afpect; and as they are tractable animals, people make them walk erect with a ftaff, and perform many tricks, to fhew their refemblance; but, in general, fuch monkeys as have no tails, have more of this likenefs than thofe that have. See plate CLXXXI, fig. 1.

MONLUSON, or MOULUCON, a town of the Lyonois, in France, forty-five miles fouth of Bourges.

MONMOUTH, the capital of Monmouthfhire, fituated on the river Wye, twenty-five miles north of Briftol.

It fends two members to parliament.

MONOCHORD, a mufical inftrument, compofed of one ftring, ufed to try the variety and proportion of founds.

It is formed of a rule, divided and fubdivided into feveral parts, on which there is a moveable ftring ftretched upon two bridges, at each extreme. In the middle between thefe is a moveable bridge, by means of which, in applying it to the different divifions of the line, the founds are found to bear the fame proportion to each other, as the divifion of the line, cut by the bridge. There are alfo monochords with forty-eight fixed bridges.

The monochord is alfo called the harmonical canon, or the canonical rule, becaufe it ferves to meafure the degrees of gravity or acutenefs.

Monochord is alfo ufed for any mufical inftrument, that confifts of only one ftring or chord; in this fenfe the trumpet-marine may properly be called a monochord.

MONOCULUS, in zoology, a genus of cruftaceous water-infects of the aptera-order, the body of which is fhort, roundifh, and covered with a firm cruftaceous fkin; its fore-legs are ramofe, and ferve for leaping and fwimming: and it has only one eye, compofed of three fmaller ones.

MONODON, in ichthyology, a fifh of the whale-kind, otherwife called narwal, or the fea-unicorn. See NARWAL.

MONODY, in antient poetry, a mournful kind of fong, fung by a perfon all alone, to give vent to his grief.

MONOECIA, in botany, one of Linnæus's claffes of plants, the twenty-firft in order; in which the male and female flowers are placed feparately on the fame plant, or rather on different ftalks growing from the fame root.

Of the plants belonging to this clafs, fome have only one ftamen, and others have three, four, five, fix, or more ftamina; whence the fubordinate orders of monoecia-monandria, monoecia-triandria, &c. others again are monadelphous, others fyngenefious, and others gynandrous.

MONOGAMY, the ftate or condition of thofe who have only been once married, and are reftrained to a fingle wife. See the article MARRIAGE.

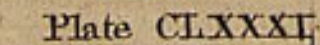


Fig. 1. MONKEYS

Oran Outang

Baboon

Satyr

Fig. 2. MULLETS

Fig. 3. MODILLIONS.

of Vignola — its Plafond

its Plafond — of Scammozzi

Fig. 4. MOULDINGS or MEMBERS

Fillet, Lift, Liftel, Reglet, Annulet, or Bandellette

Baguette or Aftragal.

Tore or Baton

Scotia, Canal, Trochilus

[Ov]olo, Quarterround, Echinus, Boultin, and Lesbian Aftragal.
[in]verted erect

[Cav]etto, Semicanal, Conge & Doric Cymatium.
Gorge

Ogee or Talon.
inverted erect

Cymatium, Cyma, Gula, Doucine, & Gorge
inverted erect

Corona, Larmier, Drip & Mouchette

Plafond and Sofite.

Eggs & Anchors

Ribbands Roses

Flowers Paternofter Beeds

T. Jefferys sculp.

MONOGRAM, a character or cypher, composed of one, two, or more letters, interwoven; being a kind of abbreviation of a name, antiently used as a seal, badge, arms, &c.

The use of arms is very antient, as appears from Plutarch, and from some greek medals of the time of Philip of Macedon and Alexander his son. The roman labarum bore the monogram of Jesus Christ, which consisted of two letters, a P placed perpendicularly through the middle of an X, as we find it on many medals in the time of Constantine, these being the two first letters of the word ΧΡΙΣΤΟΣ. Thus under the eastern empire it is usual to find MIK, which are the monogram of Mary, Jesus, Constantine.

MONOLOGUE, in poetry, a dramatic scene, in which a person appears alone on the stage, and speaks to himself.

MONOMIAL, in algebra, a root or quantity that has but one name, or consists of only one member, as *a b*, *a a b*, &c. See ROOT, QUANTITY, BINOMIAL, &c.

MONOMOTOPA, a country of Africa, bounded by Monemugi on the north, and by Cafraria on the east, south, and west.

MONOPETALOUS, in botany, a term applied to flowers that have only one petal, or flower-leaf.

MONOPOLI, a town in the kingdom of Naples, situated on the gulph of Venice: east long. 18°, and north lat. 41° 5′.

MONOPOLY, one or more persons making themselves the sole masters of the whole of a commodity, manufacture, and the like, in order to make private advantage of it, by selling it again at a very advanced price. A monopoly is also an allowance of the king, by grant, or otherwise, for the sole dealing in any thing, by which others are restrained from any freedom they had before.

Monopolies are against the antient fundamental laws of this kingdom; and it is held, that the making use of, or procuring any unlawful monopoly, is punishable at common law, by fine and imprisonment. By statute, all monopolies, grants, &c. for the sole buying, selling, or making of goods and manufactures are declared void; and the person injured thereby, may recover treble damages and double costs, by action on the statute: but this act does not extend to any privilege granted by parliament; nor to companies or societies of merchants, or corporations, &c. neither to any grant for printing, or to inventors of new manufactures, who have patents for the term of fourteen years.

MONOPTERE, in architecture, a kind of temple, round, and without walls, having a dome supported by columns.

MONOPTOTON, in grammar, a noun that has only one case, as *inficias*.

MONOPYRENEOUS, in botany, such fruit as contains only one seed, or kernel.

MONORHYME, a piece of poetry, in which all the verses end with the same rhyme.

MONOSTICH, an epigram that consists of only one single verse. See the article EPIGRAM.

MONOSYLLABLE, in grammar, a word that consists of only one syllable, and is composed of either one or more letters pronounced at the same time.

The too frequent use of monosyllables, has a very bad effect in English poetry, as Mr. Pope both intimates and exemplifies in the same verse, *viz.*

"And ten slow words oft creep in one dull line."

MONOTHELITES, a sect of Christians in the VIIth century, so called from their maintaining, that though there were two natures in Jesus Christ, the human and divine, there was but one will, which was the divine.

MONOTONY, an uniformity of sound, or a fault in pronunciation, when a long series of words are delivered in one unvaried tone.

MONOTROPA, in botany, a genus of the decandria-monogynia class of plants, the flower of which consists of ten oblong deciduous petals, serrated at the tops: the fruit is an oval, pentagonal, obtuse capsule, containing a great number of paleaceous seeds.

This genus comprehends the orobanchoides of Tournefort, and the hypopitys of Dillenius.

MONS, the capital of the province of Hainault, in the austrian Netherlands: situated twenty-six miles south-west of Brussels: east long. 3° 33′, and south lat. 50° 34′.

MONSARAZ, a town of Portugal, in the province of Alentejo: west long. 8°, and north lat. 38° 30′.

MONSEIGNEUR, MY LORD, a title of honour used by the French, in writing or speaking to dukes, peers, archbishops, bishops, and presidents à mortier. Monseigneur absolutely used, is a title now restrained to the dauphin of France; thus

thus it is ſaid, an officer belonging to monſeigneur: but this cuſtom was not introduced till the reign of Lewis XIV. the dauphin before that time being called monſieur le dauphin.

MONSIEUR, a title of civility uſed by the French, in ſpeaking to, or of their equals, or thoſe that are but a little below them: thus a duke or a marquis, when ſpeaking to an equal or inferior, uſes the word monſieur; and a mechanic ſpeaking to a mechanic, gives him the ſame title: but no body calls the french king monſieur, except the children of France.

In France the inſcriptions of all letters run thus; *A monſieur monſieur* ſuch a one.

Monſieur, abſolutely uſed, is a title given to the ſecond ſon of France, and to the king's brother.

MONSOON, in phyſiology, a ſpecies of trade-wind, in the Eaſt-Indies, which for ſix months blows conſtantly the ſame way, and the contrary way the other ſix months. See the article WIND.

However, it ought to be obſerved, that the points of the compaſs from whence the monſoons blow, as well as the times of their ſhifting, differ in different parts of the Indian ocean.

The cauſe of monſoons is this: when the ſun approaches the northern tropic, there are countries, as Arabia, Perſia, India, &c. which become hotter, and reflect more heat than the ſeas beyond the equator, which the ſun has left; the winds, therefore, inſtead of blowing from thence, to the parts under the equator, blow the contrary way; and, when the ſun leaves thoſe countries, and draws near the other tropic, the winds turn about, and blow on the oppoſite point of the compaſs.

MONSTER, *monſtrum*, in general, denotes any production that deviates from the ſpecies to which it belongs, whether with reſpect to the number or diſpoſition of its parts; in which ſenſe, a man with ſix fingers on each hand, or ſix toes on each foot, is a monſter. But the term monſter ſeems to be chiefly applied to ſuch productions as deviate very much from the ordinary courſe of nature.

MONSTIERS, or MOUSTIERS, a city of Savoy, thirty miles ſouth eaſt of Chamberry.

MONSTRANS DE DROIT, in law, is a writ which iſſues out of the court of chancery, for reſtoring a perſon to lands or tenements, that are his in right.

MONSTRANS DE FAIT, in law, is producing the deeds in open court, when an action is brought upon any deed.

MONSTRAVERUNT, in law, is a writ in behalf of a tenant that holds lands by free-charter in antient demeſne, on his being diſtrained for the payment of any ſervice or impoſition, contrary to the liberty he does or ought to enjoy. It alſo lies where a tenant is unjuſtly diſtrained for the payment of toll.

A writ of monſtraverunt may be iſſued out by any number of tenants, without naming any of them by their proper names, but only in general, the men of ſuch a place.

MONT-ALTO, a town of Italy, in the pope's territories, and marquiſate of Ancona, twenty-three miles ſouth of Loretto.

MONT ST. ANDRE, a town of the Auſtrian Netherlands, in the province of Brabant, eleven miles north of Namur.

MONTARGIS, a city of France, in the province of Orleanois, fifty miles ſouth of Paris.

MONTAUBAN, a city of France in the province of Guienne, eighteen miles north of Toloufe.

MONTBELLIARD, a city of France, in the province of Franche-comte, thirty-five miles north-eaſt of Beſançon.

MONTE SANCTO, or MOUNT-ATHOS, a mountain of European Turky, in the province of Macedon: eaſt long. 23°, and north lat. 40° 12′.

It is called Monte Sancto, or Holy Mountain, from twenty-two monaſteries ſituated upon it, in which are four thouſand monks or friars, who never ſuffer a woman to come within ſight of their convent.

MONTFERRAT, a dutchy in Italy bounded by the lordſhip of Verceil on the north, by the Alexandrin on the eaſt, by the territory of Genoa on the ſouth, and by the county of Aſti on the weſt. The chief town is Caſal.

MONTFORT, the capital of the county of Montfort, in the circle of Swabia, in Germany: eaſt long. 9° 40′, and north lat. 47° 15′.

MONTGOMERY, the capital of Montgomeryſhire, in Wales, ſituated on the river Severn, twenty miles ſouth-weſt of Shrewſbury.

MONTH, *menſis*, in chronology, the twelfth part of a year. See the article YEAR.

Time being duration, marked out for certain uſes, and meaſured by the motion

tion of the heavenly bodies, there thence results divers kinds of months as well as years, different from one another according to the particular luminary by whose revolution they are determined, and the particular purposes they are destined for: hence months are of two kinds, astronomical and civil.

An astronomical month is that which is governed either by the motion of the sun or moon, and is consequently of two kinds, solar and lunar: a solar month is that time, in which the sun seems to run through a whole sign, or the twelfth part of the ecliptic.

Hence, if regard be had to the sun's true apparent motion, the solar month will be unequal, since the sun is longer in passing through the winter-signs than through those of the summer; but as he constantly travels through all the twelve signs in 365 days, 5 hours, and 49 minutes, the quantity of a mean month will be had, by dividing that number by 12; on this principle, the quantity of a solar month will be found to be 30 days, 10 hours, 29 minutes, 5 seconds. See Earth.

A lunar month is that space of time which the moon takes up in performing its course through the zodiac, or that measured by the motion of the moon round the earth; and is of three kinds, *viz.* periodical, synodical, and that of illumination. The lunar periodical month, is the space of time wherein the moon makes her round through the zodiac, or wherein she returns to the same point, being 27 days, 7 hours, 43 minutes, 5 seconds. See the article Moon.

The lunar synodical month, called also absolutely the lunar month and lunation, is the space of time between two conjunctions of the moon with the sun; or the time it takes from one conjunction with the sun to the next; or from one new moon to another: the quantity of a synodical month is 29 days, 12 hours, 44 minutes, 43 seconds, and 11 thirds. The quantity of a synodical month is not the same at all times, for in the summer solstice, when the sun seems to move slowest, the synodical month appeareth less, being about 29 days, 6 hours, 42 minutes; but in the winter, when the sun's motion seems faster, the moon does not fetch up the sun so soon, for which reason the synodical month then seems greater, *viz.* 29 days, 19 hours, and 37 minutes, according to the observation of the same astronomers: so that the first quantity given of the synodical month, is to be understood as to the mean motion. From what has been said, it may easily appear that the difference between a periodical and synodical month is this; the first is called periodical in respect of the moon's orbit; but the synodical is so called in respect of its connection with the other luminary. Now after the time of its conjunction, the sun does not continue in the same place of the zodiac, but moves forwards towards the east, upon which it falls out that the moon, finishing its course, does not find the sun again in the same place where it left him, he being removed almost a whole sign from his former place, so that to overtake the sun again, it plainly appears that a certain space of time is requisite besides the periodical, which makes up the synodical month.

The antient Romans made use of the lunar months, and made them alternately of 29 and 30 days; and they marked the days of each month by three terms, *viz.* calends, nones, and ides. See the articles Calends, &c.

The lunar month of illumination, or apposition, or illuminative month, is the space from the first time of the moon's appearance after new moon, to her first appearance after the new moon following. The lunar month of illumination is not of any determined quantity, because the moon appears sometimes sooner, and sometimes later, after the conjunction; for which diversity astronomers give us several reasons, particularly the obliquity of the zodiac, the variable latitude of the moon, the apparent inequality of its motion, the different qualities of the summer and winter-air, &c. By this month, however, the Turks and Arabs go; and it is said that the antient Britons went by the phases of the moon.

A civil or political month, consists of a certain number of days according to the laws and customs of the different countries wherein it is used, either having no regard to the solar or lunar months, as those of the Egyptians in their equal year, of the Romans in the year of Romulus, &c. or coming pretty near to the solar astronomical month, as the julian; or else the lunar astronomical, as the jewish, turkish, and others. The british and most european nations make 12 months in the year, *viz.* January, February, &c. See the articles January, &c.

Civil solar months, are such civil months as are accommodated to the astronomical months,

months, or thofe which are to confift alternately of 30 and 31 days, excepting one month of the twelve, which, for every fourth year, confifted of 30 days, and for the other years of 29. This form of civil months was introduced by Julius Cæfar; but under Auguftus the fixth month, till then, from its place, called Sextilis, was denominated Auguftus, in honour of that prince; and to make the compliment yet the greater, a day was added to it, fo that it now confifts of 31 days, though till then it had only 30: to make up for which, a day was taken from February, fo that from thencefor-ward it only confifted of 28 days, and every fourth year of 29; though before it had ordinarily confifted of 29 days, *&c.* and fuch are the civil or calendar months which now obtain throughout Europe.

Civil lunar months are to confift alternately of 29 and 30 days: thus will two civil months be equal to two aftronomical ones, abating for the odd minutes, and confequently the new moon will be hereby kept to the firft day of each fuch civil month, for a long time together. However, to make them keep conftantly pace with the civil months, at the end of each 948 months, a month of 29 days muft be added; or elfe every 33d month muft confift of 30 days. This was the month in civil or common ufe among the Jews, Greeks, and Romans, till the time of Julius Cæfar.

Philofophical MONTH, among chemifts, is the fpace of 40 days and nights.

MONTIA, BLINKS, in the linnæan fyftem of botany, a genus of the triandria-trigynia clafs of plants, the corolla whereof confifts of a fingle petal, and is divided at the extremity into five parts; three of the fegments are fmaller than the others, and produce ftamina; thefe ftand alternately with the two larger: the fruit is a turbinated obtufe capfule, covered by the cup, compofed of three valves, and having three cells; the feeds are three in number and roundifh.

MONTIFRINGILLA, the BRAMBLING, in zoology, a fpecies of the fringilla, with the bafe of the wings a gold-yellow underneath. See FRINGILLA.

MONTMARIANO, a town of Italy, in the kingdom of Naples and further Principate, fituated thirty-five miles eaft of Naples.

MONTMEDY, a town of the Auftrian Netherlands, in the province of Luxemburg, fituated twenty miles weft of Luxemburg.

MONTMELIAN, a fortrefs in the dutchy of Savoy, fituated on the frontiers of Dauphiné, ten miles fouth of Chamberry.

MONTPAGNOTE, or POST *of the invulnerable*, in the military art, an eminence chofen out of the reach of the cannon of a place befieged, where curious perfons poft themfelves, to fee an attack, and the manner of the fiege, without being expofed to any danger.

MONTPELIER, a city of France, in the province of Languedoc and county of Nifmes, fituated on the little river Lez, fifty miles north-eaft of Narbonne, and forty-five miles fouth-weft of Avignon; a place famous for its delightful fituation, its healthy ferene air, and medical compofitions.

MONTREAL, a city of Sicily, in the province of Mazara, fituated near the fea, five miles eaft of Palermo.

MONTREAL is alfo a town of Canada, in North America, fituated on the river of St. Laurence, one hundred miles fouth of Quebec.

MONTREVIL, a town of France, thirty miles fouth of Calais.

MONTROSE, a town of North Britain, in the fhire of Angus, fituated at the mouth of the river Efk, on the German ocean, forty-fix miles north-eaft of Edinburgh.

Steel-fpaws are very numerous in the country about Montrofe; befides thefe there is a well near this town, whofe water is of a whitifh colour, foft tafte, and faintly difcovering a mineral quality, and is of a different nature from the fteel one. It is univerfally diuretic, and has been found ufeful in ftranguries, ftoppages of urine, fcorbutic diforders, flatulencies, *&c.*

MONTROYAL, or MONTREAL, a fortrefs of Germany, in the circle of the lower Rhine and electorate of Triers, fituated twenty miles north-eaft of Triers.

MONTSERAT, a mountain of Spain, in the province of Catalonia, twenty-one miles north-weft of Barcelona, where there is a monaftery and chapel dedicated to the Virgin Mary, to which there is a great refort of pilgrims.

MONTSERAT is alfo one of the fmalleft of the Caribbee-iflands, fubject to Great Britain: it is fituated about thirty miles fouth-weft of Antigua.

MONUMENT, in architecture, a building deftined to preferve the memory, *&c.* of the

the person who raised it, or for whom it was raised; such are a triumphal arch, a mausoleum, a pyramid, &c. The first monuments that were erected by the antients, were of stones, which were laid over tombs, on which were cut the names and actions of the deceased. These stones were distinguished by various names, according as their figures were different: the Greeks called those which were square at the base, and were the same depth throughout their whole length, steles; from whence our square pillasters, or attic columns, are derived: those which were round in their base, and ended in a point at top, they called styles; which gave occasion to the invention of diminished columns: those which were square at the foot, and terminated in a point at the top, in the manner of a funeral pile, they called pyramids: to those whose bases were more in length than in breadth, and which rose still lessening to a very great height, resembling the figure of the spits or instrument used by the antients in roasting the flesh of their sacrifices, they called obelisks. See OBELISKS, &c.

The MONUMENT, absolutely so called among us, is a magnificent pillar, erected by order of parliament, in memory of the burning of the city of London, *anno* 1666, in the very place where the fire began. This pillar is of stone, of the doric order, and fluted. It is one of the boldest pieces of architecture that ever was attempted, being 202 feet high, and the diameter 15; it stands on a pedestal 40 feet high, and 21 feet square, the front being enriched with curious emblems in basso relievo: within are winding stairs, up to the very top.

MONYCHA, among naturalists, an appellation given to animals with single or undivided hoofs. See the article HOOF.

MOOD, or MODE, in logic, called also syllogistic mood, a proper disposition of the several propositions of a syllogism, in respect of quantity and quality. See the articles SYLLOGISM, QUANTITY, and QUALITY.

As in all the several dispositions of the middle term, the propositions of which a syllogism consists, may be either universal or particular, affirmative or negative; the due determination of these, and putting them together as the laws of argumentation require, constitute what logicians call the moods of syllogisms. Of these moods there are a determinate number to every figure, including all the possible ways in which propositions, differing in quantity or quality, can be combined, according to any disposition of the middle term, in order to arrive at a just conclusion. There are two kinds of moods, the one direct, the other indirect.

The direct mood is that wherein the conclusion is drawn from the premises directly and immediately, as, "Every animal "is a living thing, every man is a living "animal; therefore, every man is a liv-"ing thing." There are fourteen of these direct moods, four whereof belong to the first figure, four to the second, and six to the third. They are denoted by so many artificial words framed for that purpose, *viz.* 1. Barbara, celarent, darii, ferioque. 4. Baralip, celantes, dabitis, fapesmo, frisesom. 2. Cesare, camestres, festino, baroco. 3. Darapti, felapton, disamis, datisi, bocardo, ferison. The use and effect of which words lie wholly in the syllables, and the letters whereof the syllables consist; each word, for instance, consists of three syllables, denoting the three popositions of a syllogism, *viz.* major, minor, and conclusion: add, that the letters of each syllable are either vowels or consonants; the vowels are A, which denotes an universal affirmative; E, an universal negative; I, a particular affirmative; and O, a particular negative: thus Barbara is a syllogism or mood of the first figure, consisting of three universal affirmative propositions: Baralip, one of the fourth figure, consisting of two universal affirmative premises, and a particular affirmative conclusion. The consonants are chiefly of use in the reduction of syllogisms. See FIGURE and REDUCTION.

The indirect mood, is that wherein the conclusion is not inferred immediately from the premises, but follows from them by means of a conversion; as, "Every "animal is a living thing, every man is "an animal; therefore some living thing "is a man."

MOOD, or MODE, in grammar, the different manner of conjugating verbs, serving to denote the different affections of the mind. See the article VERB.

Hence arise four moods, *viz.* the indicative, subjunctive, and imperative: of these the three first are called finite moods, because they define a certain person and number; but the fourth is called the infinitive, because in it there is no distinction of either person or number. See the article INDICATIVE, &c.

Some grammarians reckon five moods, *viz.*

viz. the indicative, fubjunctive, optative, imperative, and infinitive; and fome make fix, dividing the optative into potential and optative. See the articles OPTATIVE and POTENTIAL.

The Greeks have five moods, differing in termination; but the Latins have only four. The englifh terminations are the fame in all the moods.

MOOD, or MODE, in philofophy, and in mufic. See the article MODE.

MOON, *luna*, ☽, in aftronomy, a fatellite, or fecondary planet, always attendant on our earth.

Of the fix primary planets, we find but three that are certainly attended with moons, *viz.* the earth, jupiter, and faturn; for though Mr. Short has given an account of a phænomenon that he obferved fome years ago, which feems extremely like a moon about venus, yet, as it was never obferved before nor fince, through the beft of telefcopes, it does not appear to be a moon. See the articles JUPITER, EARTH, and SATURN.

Aftronomers have drawn the face of the moon, according as it is feen with the beft telefcopes; for which we are obliged to the accurate labours of the famous felenographers Florentius, Langrenus, John Hevelius of Dantzic, Grimaldus and Ricciolus, Italians; who have taken particular care to note all the fhining parts of the moon's face, and, for the better diftinguifhing them, they have given to each part a proper name. Langrenus and Ricciolus have divided the lunar regions among the philofophers and aftronomers, and other eminent men; but Hevelius fearing left the philofophers fhould quarrel about the divifions of the lands, has fpoiled them of this their property, and given the parts of the moon thofe geographical names that belong to the different iflands, countries, and feas of our earth, without any regard to their fituation or figure. See plate CLXXXII. fig. 1.

That the furface of the moon is not fmooth or even, but diverfified with hills and vales, continents and feas, lakes, *&c.* any one would imagine, who views her face through a large telefcope. That fhe has variety of hills and mountains is demonftrable from the line which bounds the light and dark parts not being an even regular curve, as it would be upon a fmooth fpherical furface, but an irregular broken line, full of dents and notches, as reprefented, *ibid.* fig. 2. Alfo becaufe fome fmall (and many large) bright fpots appear in the dark portion, ftanding out at feveral diftances from the boundary line; which fpots in a few hours become larger, and at laft unite with the enlightened portion of the difk. For the method of meafuring thefe lunar mountains, fee MOUNTAIN.

On the other hand, we obferve many fmall fpots interfperfed all over the bright part, fome of which have their dark fides next the fun, and their oppofite fides very bright and circular, which infallibly proves them to be deep, hollow round cavities; of which there are two very remarkable ones near together on the upper part, and may be viewed exceedingly plain, when the moon is about four or five days old. The depth of thefe lunar cavities prodigioufly exceeds the height of the mountains, and confequently the furface of the moon has but little refemblance to that of the earth in thefe refpects.

Since, then, the moon's furface appears to be fo very mountainous and irregular, it has been a queftion, how it comes to pafs that the bright circular limb of the difk does not appear jagged and irregular, as well as the curve bounding the light and dark parts: in anfwer to this, it muft be confidered, that, if the furface of the moon had but one row of mountains placed round the limb of the difk, the faid bright limb would then appear irregularly indented; but fince the furface is all over mountainous, and fince the vifible limb is to be confidered not as a fingle curve line, but a large zone, having many mountains one behind another, from the obferver's eye, it is evident the mountains in fome rows being oppofite to the vales in others, will fill up the inequalities in the vifible limb in the remoter parts, which diminifh to the fight and blend with each other, fo as to conftitute, like the waves of the fea, one uniform and even horizon. Whether there be feas, lakes, *&c.* in the moon, has been a queftion long debated, but now concluded in the negative: for in thofe large darker regions, which were thought to be feas, we view, through a good telefcope, many permanent bright fpots, as alfo caverns and empty pits, whofe fhadows fall within them, which can never be feen in feas or any liquid fubftance. Their dark and dufky colour may proceed from a kind of matter or foil, which reflects light lefs than that of the other regions. Thefe

ſpots have continued always the ſame unchangeably, ſince they were firſt viewed with a teleſcope; though leſs alterations than what happen in the earth, in every ſeaſon of the year, by verdure, ſnow, inundations, and the like, would have cauſed a change in their appearance. But indeed as there are no ſeas nor rivers in the moon, and no atmoſphere, ſo of courſe there can be no clouds, rain, ſnow, or other meteors, whence ſuch changes might be expected.

Sir Iſaac Newton mentions an atmoſphere about the moon, but other aſtronomers think there is reaſon (not to ſay a demonſtration) for the contrary: for were there an atmoſphere of air like ours, it muſt neceſſarily obſcure the fixed ſtars in the moon's appulſe to them; but it has been obſerved that this never happens: on the contrary, they preſerve all their ſplendor to the moment of their occultation, and then diſappear inſtantaneouſly, and in the ſame manner they recover their light, when they appear again on the other ſide.

The diſtance of our moon from the earth is determined by her horizontal parallax, or the angle which the ſemidiameter of the earth ſubtends at the moon, *viz.* the angle A O C (*ibid.* fig. 3.) which is the difference between the true place of the moon's center O, when in the horizon, and the apparent place thereof, as viewed from the ſurface of the earth at A. The former is known by aſtronomical tables, the latter by obſervation: and the quantity of this difference, or angle, at a mean, is 57′ 12″ = A O C.

If therefore we ſay, as the tangent of 57′ 12″ is to radius, ſo is A C = 1 to C O = 60,1; this will be the mean diſtance of the moon in ſemidiameters of the earth. Therefore, ſince one ſemidiameter of the earth contains 3982 miles, we have 3982 × 60,1 = 239318,2 = C O the mean diſtance of the moon.

The moon's apparent ſemidiameter M O meaſures, at her mean diſtance, 15′ 38″ = 938″ by the micrometer, which is the quantity of the angle MCO. The earth's diameter, therefore, is to the moon's, as 3432″ to 938; that is, as 109 to 30, or as 3,63 to 1. Wherefore $\frac{30}{109} \times 7964 =$ 2192 miles the moon's diameter.

Therefore the face of the earth, as it appears to the lunarians, is to the face of the moon, as it appears to us, as 109 × 109 to 30 × 30, *viz.* as 11881 to 900, or as 13,2 to 1. And the real bulk of the earth is to that of the moon as 109 × 109 × 109 to 30 × 30 × 30, *viz.* as 1295029 to 27000, that is, as 1295 to 27, or as 48 to 1 very nearly.

Since, as we have ſhewn, the mean diſtance of the moon is about 60 ſemidiameters of the earth, at the diſtance of the moon one degree of the earth's ſurface will ſubtend an angle of one minute, and will therefore be viſible; but ſuch a degree is equal to $69\frac{1}{2}$ miles; therefore a ſpot or place 70 miles in diameter, in the moon, will be juſt viſible to the naked eye. Hence a teleſcope that magnifies about 100 times, will juſt diſcover a ſpot whoſe diameter is $\frac{1}{100}$ of 70 miles, or $\frac{7}{10}$ of a mile, of 3698 feet: and a teleſcope that will magnify 1000 times, will ſhew an object that is but $\frac{7}{100}$ of a mile, that is, whoſe diameter is but 370 feet, or little more than 120 yards; and therefore will eaſily ſhew a ſmall town or village, or even a gentleman's ſeat, if any ſuch there be.

The time which the moon takes up in making one revolution about the earth, from a fixed ſtar to the ſame again, is 27d. 7h. 43′, which is called the periodical month. But the time that paſſes between two conjunctions, that is, from one new moon to another, is equal to 29 d. 12 h. 44′ 3″, which is called a ſynodical month: for, after one revolution is finiſhed, the moon has a ſmall arch to deſcribe to get between the ſun and the earth, becauſe the ſun keeps advancing forward in the ecliptic. Now this ſurplus of motion takes up 2 d. 5 h. 1′ 3″, which added to the periodical month makes the ſynodical, according to the mean motions.

The moon moves about its own axis in the ſame time that it moves about the earth, from whence it comes to paſs that ſhe always ſhews the ſame face to us: for by this motion about her axis, juſt ſo much of her ſurface is turned towards us conſtantly, as by her motion about the earth would be turned from us.

But ſince this motion about the axis is equable and uniform, and that about the earth, or common center of gravity, is unequal and irregular, as being performed in an ellipſis, it muſt follow that the ſame part of the moon's ſurface, preciſely, can never be ſhewn conſtantly to the earth; and this is confirmed by the teleſcope, through which we often obſerve a little gore or ſegment on the eaſtern and weſtern

western limb appear and disappear by turns, as if her body librated to and fro; which therefore occasioned this phænomenon to be called the moon's libration. The orbit of the moon is elliptical, more so than any of the planets, and is perpetually changing or variable, both in respect of its figure and situation; of which we shall treat more largely further on. The inclination of the moon's orbit to the plane of the ecliptic is also variable, from 5° to 5° 18′. The line of the nodes likewise has a variable motion from east to west, contrary to the order of the signs, and completes an entire revolution in a space of time a little less than nineteen years. Also the line of the apsides, or of the apogee and perigee, has a direct motion from west to east, and finishes a revolution in the space of about nineteen years. All which will be more copiously treated of, when we come to explain the physical causes thereof.

The phases of the moon in every part of the orbit, are easily accounted for from her different situation with respect to the earth and sun: for, though to an eye placed in the sun she will always exhibit a complete illuminated hemisphere; yet in respect to the earth, where the hemisphere is viewed in all degrees of obliquity, it will appear in every degree from the greatest to the least; so that at E, (plate CLXXXII. fig. 4, and 5.) no part at all of the enlightened surface can be seen. At D, a little part of it is turned towards the earth, and from its figure it is then said to be horned. At C, one half of the enlightened surface is turned to the earth, and she is then said to be dichotomised, and in her first quarter or quadrature. At B, a part more than half is turned to the earth, and then she is said to be gibbous. At A, her whole illuminated hemisphere is seen, being then in opposition to the sun; and this is called the full moon. At H, she is again gibbous, but on the other part; at G she is again dichotomised, and in her last quarter; at F she is horned, as before; and then becomes new again at E, where she is in conjunction with the sun.

If MN be drawn perpendicular to the line SL joining the centers of the sun and moon, and OP perpendicular to the line TL joining the centers of the earth and moon, it is evident that the angle PLN in the first half of the orbit, and OLM in the second, will be proportional to the quantity of the illuminated disk turned towards the earth; and this angle is every where equal to the angle ETL, which is called the elongation of the moon from the sun.

To find what quantity of the moon's visible surface is illustrated for any given time, we are to consider that the circle of illumination BFC, (*ibid.* fig. 6.) is oblique to the view every where, but at E and A; and therefore by the laws of the orthographic projection, it will be projected into an ellipse whose longest axis is the diameter of the moon BC, and the semi-conjugate is FL = cosine of the angle of elongation FBP. Hence FP = versed sine of the said angle. But from the nature of the circle and ellipse, we have LP in a constant ratio to FP, wherever the line OP is drawn perpendicular to B; therefore also 2 LP = PO has a constant ratio to FP. But (by Euclid V. 12.) the sum of all the lines OP = area of the circle is to the sum of all the lines FP = area of the illuminated part, as the diameter of the circle OP to the versed sine of the elongation FP.

As the moon illuminates the earth by a reflex light, so does the earth the moon; but the other phænomena will be different for the most part. 1. The earth will be visible but to little more than one half of the lunar inhabitants. 2. To those who see it, the earth appears fixed, or at least to have no circular motion, but only that which results from the moon's libration. 3. Those who live in the middle of the moon's visible hemisphere, see the earth directly over their heads. 4. To those who live in the extremity of that hemisphere, the earth seems always nearly in the horizon, but not exactly there, by reason of the libration. 5. The earth, in the circle of a month, would have all the same phases as the moon has. Thus the lunarians, when the moon is at E, in the middle of their night, see the earth at full, or shining with a full face; at C and G it is dichotomised, or half light and half dark; at A it is wholly dark, or new; and at the parts between these it is gibbous. 6. The earth appears variegated with spots of different magnitudes and colours, arising from the continents, islands, oceans, seas, clouds, &c. 7. These spots will appear constantly revolving about the earth's axis, by which the lunarians will determine the earth's diurnal

diurnal rotation, in the fame manner as we do that of the fun.

Theory of the MOON's *motion.* As the moon is the neareft to us in the folar fyftem, and as great advantages may be deduced from her motions, we fhall be the fuller on this fubject. If then the fun acted equally on the earth and moon, and always in parallel lines, this action would only ferve to reftrain them in their annual motions round the fun, and no way affect their action on each other, or their motions about the common center of gravity. But becaufe the moon is nearer the fun in one half of her orbit than the earth is, and at a greater diftance in the other half, and the power of gravity being always greater at a lefs diftance, it follows, that, in one half of her orbit, the moon is more attracted than the earth towards the fun, and in the other half lefs attracted; and hence irregularities neceffarily arife in the motion of the moon, the excefs in the firft cafe, and the defect in the fecond, becoming a force that difturbs her motion: add to this, that the action of the fun on the earth and moon is not directed in parallel lines, but in lines that meet at the center of the fun. Suppofe the moon fetting out from the quarter that precedes the conjunction, with a velocity that would make her defcribe an exact circle round the earth, if the fun's action had no effect on her; and becaufe her gravity is increafed by that action, fhe muft defcend towards the earth, and move within that circle: her orbit there, will be more curve than otherwife it would have been; becaufe this addition to her gravity will make her fall farther at the end of an arc below the tangent drawn at the other end of it; her motion will be accelerated by it, and will continue to be accelerated till fhe arrives at the enfuing conjunction; becaufe the direction of the action of the fun upon her, during that time, makes an acute angle with the direction of her motion. At the conjunction, her gravity towards the earth being diminifhed by the action of the fun, her orbit will be lefs curve there for that reafon; and fhe will be carried farther from the earth as fhe moves to the next quarter; and, becaufe the action of the fun makes then an obtufe angle with the direction of her motion, fhe will be retarded by the fame degrees by which fhe was accelerated before.

Thus fhe will defcend a little towards the earth, as fhe moves from the firft quarter towards the conjunction, and afcend from it, as fhe moves from the conjunction to the next quarter. The action which difturbs her motion will have a like and almoft equal effect upon her, while fhe moves in the other half of her orbit, or that half of it which is fartheft from the fun: fhe will proceed from the quarter that follows the conjunction with an accelerated motion to the oppofition, approaching a little towards the earth, becaufe of the addition made to her gravity, at that quarter, from the action of the fun; and receding from it again, as fhe goes on from the oppofition to the quarter from which we fuppofed her to fet out. The areas defcribed in equal times by a ray drawn from the moon to the earth will not be equal, but will be accelerated by the confpiring action of the fun, as fhe moves towards the conjunction or oppofition from the quarters that precede them; and will be retarded by the fame action, as fhe moves from the conjunction or oppofition to the quarters that fucceed them.

Sir Ifaac Newton has computed the quantities of thefe irregularities from their caufes. He finds, that the force added to the gravity of the moon in her quarters, is to the gravity with which fhe would revolve in a circle about the earth, at her prefent mean diftance, if the fun had no effect on her, as 1 to $178\frac{29}{40}$. He finds the force fubducted from her gravity, in the conjunctions and oppofitions, to be double of this quantity, and the area defcribed in a given time in the quarters, to be to the area defcribed in the fame time in the conjunctions and oppofitions, as 10973 to 11073. He finds, that, in fuch an orbit, her diftance from the earth in her quarters, would be to her diftance in the conjunctions and oppofitions, as 70 to 69.

From the fame principle of gravitation, may the retrograde motion of the nodes be accounted for. See NODE.

The quantity of this retrograde motion is found by computation to be 19° 18′ 1″ in a year, and the aftronomical tables make it only 19° 21′ 21″; fo that the theory agrees nearly with obfervation.

The action of the fun diminifhes the gravity of the moon towards the earth, in the conjunctions and oppofitions, more than it adds to it in the quarters, and, by diminifhing the force which retains the moon in her orbit, it increafes her

diſtance from the earth and her periodic time: and becauſe the earth and moon are nearer the ſun in their perihelium than in their aphelium, and the ſun acts with a greater force there, ſo as to ſubduct more from the moon's gravity towards the earth; it follows, that the moon muſt revolve at a greater diſtance, and take a longer time to finiſh her revolution in the perihelium of the earth, than in the aphelium; and this alſo is conformable to obſervation.

There is another remarkable irregularity in the moon's motion, which alſo ariſes from the action of the ſun, *viz.* the progreſſive motion of the apſides. In the quarters, the ſun's action adds to the gravity of the moon, and the force it adds is greater, as the diſtance of the moon from the earth is greater; ſo that the action of the ſun hinders her gravity towards the earth, from decreaſing as much while the diſtance increaſes, as it ought to do according to the regular courſe of gravity; and therefore, while the moon is in the quarters, her apſides muſt recede. In the conjunction and oppoſition, the action of the ſun ſubducts from the gravity of the moon towards the earth, and ſubducts the more the greater her diſtance from the earth is, ſo as to make her gravity decreaſe more as her diſtance increaſes, than according to the regular courſe of gravity; and therefore, in this caſe, the apſides are in a progreſſive motion. Becauſe the action of the ſun ſubducts more in the conjunctions and oppoſitions from her gravity, than it adds to it in the quarters, and, in general, diminiſhes more than it augments her gravity; hence it is that the progreſſive motion of the apſides exceeds the retrograde motion; and therefore, the apſides are carried round according to the order of the ſigns.

Thus the various irregularities of the moon's motion are explained from gravity; and from this theory, with the aſſiſtance of a long ſeries of accurate obſervations, her motion may be at length reduced ſo exactly to computation, and her appulſes to the fixed ſtars, over which ſhe paſſes in her courſe, may be predicted with ſo much accuracy, as to afford, on many occaſions, an opportunity to navigators to diſcover their longitude at ſea.

From this theory, what by all aſtronomers was thought moſt difficult, and even impoſſible to be done, the incomparable Sir Iſaac Newton has effected, *viz.* To determine by calculation the moon's place, even in her quadratures, and all other parts of her orbit, beſides the ſyzygies; and that ſo accurately, that the difference between that and her true place in the heavens, ſhall ſcarce be two minutes.

In 20 julian years, or 7305 days, the ſun's mean motion was found to be 20 revolutions, 9 minutes, 4 ſeconds: and the motion of the ſun's apogee, 21 minutes. The motion of the moon, in the ſame time, 247 revolutions, 4 ſigns, 13 degrees, 34 minutes, 5 ſeconds; the motion of the lunar apogee, 2 revolutions, 3 ſigns, 3 degrees, 50 minutes, 15 ſeconds; and the motion of her nodes, 1 revolution, 26 degrees, 50 minutes, 15 ſeconds: all which motions are accounted from the vernal equinox. Wherefore, if from them be ſubtracted the proceſſion of the equinoctial point during that ſpace, which is 16 minutes, there will remain the motions in reference to the fixed ſtars in 20 julian years, *viz.* The ſun's 19 revolutions, 11 ſigns, 29 degrees, 52 minutes, 24 ſeconds; of his apogee, 4 minutes, 20 ſeconds. The moon's 247 revolutions, 4 ſigns, 13 degrees, 17 minutes, 25 ſeconds; of her apogee, 2 revolutions, 3 ſigns, 3 degrees, 33 minutes, 35 ſeconds; and of her nodes, 1 revolution, 27 degrees, 6 minutes, 55 ſeconds.

According to this computation, the tropical year is 365 days, 5 hours, 48 minutes, 57 ſeconds; and the ſidereal year, 365 days, 6 hours, 9 minutes, 14 ſeconds.

But theſe mean motions of the luminaries being affected with the inequalities already mentioned, render a number of equations and reductions neceſſary.

The annual equations of the foreſaid mean motions of the ſun and moon, and of the apogee and nodes of the moon, have been already treated of in the article Equation.

Only let it be obſerved, that if the equation of the ſun's center be required to be added, then the equation of the moon's mean motion muſt be ſubſtracted, that of her apogee muſt be added, and that of the node ſubducted. And, on the contrary, if the equation of the ſun's center were to be ſubducted, the moon's equation muſt be added, the equation of her apogee ſubducted, and that of her node added.

There is alſo an equation of the moon's mean motion depending on the ſituation of

of her apogee, in refpect of the fun; which is greateft when the moon's apogee is in an octant with the fun, and is nothing at all when it is in the quadratures or fyzygies. This equation, when greateft and the fun in perigæo, is 3 minutes 56 feconds: but if the fun be in apogæo, it will never be above 3 minutes 34 feconds. At other diftances of the fun from the earth, this equation, when greateft, is reciprocally as the cube of fuch diftance. But, when the moon's apogee is any where but in the octants, this equation grows lefs, and is moftly at the fame diftance between the earth and the fun, as the fine of the double diftance of the moon's apogee from the next quadrature or fyzygy to the radius. This is to be added to the moon's motion, while her apogee paffes from a quadrature with the fun to a fyzygy; but this is to be fubtracted from it, while the apogee moves from the fyzygy to the quadrature.

There is, moreover, another equation of the moon's motion which depends on the afpect of the nodes of the moon's orbit with the fun: and this is greateft, when her nodes are in octants to the fun; and vanifhes quite, when they come to their quadratures or fyzygies. This equation is proportional to the fine of the double diftance of the node from the next fyzygy or quadrature, and at greateft is but 47 feconds. This muft be added to the moon's mean motion, while the nodes are paffing from their fyzygies with the fun to their quadratures with him; but fubtracted, while they pafs from the quadratures to the fyzygies.

From the fun's true place take the equated mean motion of the lunar apogee, as was above fhewed, the remainder will be the annual argument of the faid apogee. From hence the excentricity of the moon and the feeond equation of her apogee, may be compared after the manner following (which takes place alfo in the computation of any other intermediate equations).

Let T (*ibid.* fig. 7.) reprefent the earth, TS a right line joining the earth and fun, TACB a right line drawn from the earth to the middle or mean place of the moon's apogee, equated as above: let the angle STA be the annual argument of the aforefaid apogee, TA the leaft excentricity of the moon's orbit, TB the greateft; biffect AB in C, and on the center C, with the diftance AC, defcribe a circle AFB, and make the angle BCF = to the double of the annual argument. Draw the right line TF; that fhall be the excentricity of the moon's orbit; and the angle BTF is the fecond equation of the moon's apogee required. In order to whofe determination, let the mean diftance of the earth from the moon, or the femidiameter of the moon's orbit, be 1000000; then fhall its greateft excentricity TB, be 66782 fuch parts; and the leaft TA, 43319. So that the greateft equation of the orbit, *viz.* when the apogee is in the fyzygies, will be 7 degrees, 39 minutes, 30 feconds, or perhaps 7 degrees, 40 minutes (for he fufpects there will be fome alteration according to the pofition of the apogee in cancer or capricorn). But, when it is in quadrature to the fun, the greateft equation aforefaid will be 4 degrees, 57 minutes, 56 feconds; and the greateft equation of the apogee 12 degrees, 15 minutes, 4 feconds.

Having from thefe principles made a table of the equation of the moon's apogee, and of the excentricities of her orbit to each degree of the annual argument, from whence the excentricity TF and the angle BTF (*viz.* the fecond and principal equation of the apogee) may eafily be had for any time required: let the equation thus found be added to the firft equated place of the moon's apogee, if the annual argument be lefs than 90 degrees, or greater than 180 degrees, and lefs than 270°, otherwife it muft be fubducted from it; and the fum or difference fhall be the place of the lunar apogee fecondarily equated; which, being taken from the moon's place equated a third time, fhall leave the mean anomaly of the moon correfponding to any given time. Moreover, from the mean anomaly of the moon, and the before found excentricity of her orbit, may be found (by means of a table of equations of the moon's center made to every degree of the mean anomaly, and fome excentricities, *viz.* 45000, 50000, 55000, 60000, and 65000) the proftaphærefis or equation of the moon's center, as in the common way: and this being taken from the former femicircle of the middle anomaly, and added in the latter to the moon's place thus thrice equated, will produce the place of the moon a fourth time equated.

The greateft variation of the moon (*viz.* that which happens when the moon is in an

an octant with the sun) is nearly, reciprocally, as the cube of the distance of the sun from the earth; let that be taken 37 minutes, 25 seconds, when the sun is in perigæo, and 33 minutes, 40 seconds, when she is in apogæo: and let the differences of this variation in the octants be made reciprocally as the cubes of the distances of the sun from the earth; and so let a table be made of the aforesaid variation of the moon in her octants (or its logarithms) to every 10th, 6th, or 5th distance of the mean anomaly: and, for the variation out of the octants, make, as radius to the sine of the double distance of the moon from the next syzygy or quadrature : : so let the aforesaid variation in the octant be to the variation congruous to any other aspect; and this added to the moon's place before found in the first and third quadrant (accounting from the sun) or subducted from it in the second and fourth, will give the moon's place equated a fifth time.

Again, as radius to the sine of the sum of the distances of the moon from the sun, and of her apogee from the sun's apogee (or the sine of the excess of that sum above 360 degrees) : : so is 2 minutes, 10 seconds, to a 6th equation of the moon's place, which must be subtracted, if the aforesaid sum or excess be less than a semicircle, but added, if it be greater. Let it be made also as radius to the sine of the moon's distance from the sun : : so 2 degrees 20 seconds to a seventh equation: which, when the moon's light is increasing, add, but when decreasing, subtract; and the moon's place will be equated a seventh time, and this is her place in her proper orbit.

But let it be observed, that the equation, thus produced by the mean quantity 2 degrees, 20 seconds, is not always of the same magnitude, but is increased and diminished according to the position of the lunar apogee. For if the moon's apogee be in conjunction with the sun's, the aforesaid equation is about 54 seconds greater. But when the apogees are in opposition, it is about as much less; and it librates between its greatest quantity 3 minutes 14 seconds, and its least 1 minute 26 seconds. And this is when the lunar apogee is in conjunction or opposition with the sun's: but in the quadratures, the aforesaid equation is to be lessened about 50 seconds, or 1 minute, when the apogees of the sun and moon are in conjunction; but if they are in opposition, for want of a sufficient number of observations, he cannot determine whether it is to be lessened or increased. And, even as to the augment or decrement of the equation 2 minutes, 20 seconds, abovementioned, he dares determine nothing certain, for the same reason, *viz.* the want of observations accurately made.

If the sixth and seventh equations are augmented or diminished in a reciprocal ratio of the distance of the moon from the earth, *i. e.* in a direct ratio of the moon's horizontal parallax, they will become more accurate: and this may readily be done, if tables are first made to each minute of the said parallax, and to every sixth or fifth degree of the augment of the sixth equation for the sixth, as of the distance of the moon from the sun for the seventh equation.

From the sun's place take the mean motion of the moon's ascending node, equated as above; the remainder shall be the annual argument of the node, whence its second equation may be computed after the following manner in the foregoing figure, *ibid.* fig. 7.

Let T, as before, represent the earth; TS a right line conjoining the earth and sun: let also the line TACB be drawn to the place of the aforesaid node of the moon, as above equated; and let STA be the annual argument of the node. Take TA from a scale, and let it be to AB : : as 56 to 3, or as $11\frac{1}{3}$ to 1. Then bissect AB in C, and on C as a center, with the distance CA, describe a circle, as AFB, and make the angle BCF, equal to double the annual argument of the node before found: so shall the angle BTF be the second equation of the ascending node; which must be added when the node is passing from the quadrature to a syzygy with the sun, and subducted when the node moves from a syzygy towards a quadrature. By which means the true place of the node of the lunar orbit will be gained: whence, from tables made after the common way, the moon's latitude and the reduction of her orbit to the ecliptic may be computed, supposing the inclination of the moon's orbit to the ecliptic to be 4 degrees, 59 minutes, 35 seconds, when the nodes are in quadrature with the sun; and 5 degrees, 17 minutes, 20 seconds, when they are in the syzygies.

And from the longitude and latitude thus found, and the given obliquity of the ecliptic 23 degrees, 29 minutes, the right

right afcenfion and declination of the moon will be found.

The horizontal parallax of the moon, when fhe is in the fyzygies at a mean diftance from the earth, he makes to be fifty-feven minutes, 30 feconds; and her horary motion 33 minutes, 32 feconds, 32 thirds; and her apparent diameter 31 minutes, 30 feconds. But in her quadratures, at a mean diftance from the earth, he makes the horizontal parallax of the moon to be 59 minutes, 40 feconds; her horary motion 32 minutes, 12 feconds, 2 thirds; and her apparent diameter 31 minutes, 3 feconds: the moon in an octant to the fun, and at a mean diftance, hath her center diftant from the center of the earth about $60\frac{2}{9}$ of the earth's femidiameters.

The fun's horizontal parallax he makes to be 10 feconds, and its apparent diameter, at a mean diftance from the earth, 32 minutes, 15 feconds.

The atmofphere of the earth, by difperfing and refracting the fun's light, at leaft to the height of 40 or 50 geographical miles, cafts a fhadow upon the moon in a lunar eclipfe, and thereby makes the earth's fhadow larger than it would otherwife be; and to each mile of the earth's atmofphere, is correfpondent a fecond in the moon's difc: hence the femi-diameter of the earth's fhadow, projected upon the moon's difc, is to be increafed about 50 feconds; or, which is all one in a lunar eclipfe, the horizontal parallax of the moon is to be increafed in the ratio of about 70 to 69.

Moon-dial. See the article Dial.

Moon-eyed, in the manege, the fame with moon-blind. See Blind.

Moon-fish, a fpecies of the oftracion, otherwife called the orbis, or globe-fifh. See the article Ostracion.

Moon-seed, *menifpermum*, in botany. See the article Menispermum.

Moon-trefoil, a plant otherwife called medicago. See Medicago.

Moon-wort, *lunaria*, in botany. See the article Lunaria.

MOOR, in country affairs, denotes an unlimited tract of land, ufually over-run with heath.

Moor-buzzard, the englifh name of the yellow-legged falcon, with an iron-coloured body and yellow head. It is about the fize of a common crow, and has its englifh name from building its neft in moorifh and boggy places.

Moor-cock, or gor-cock, a fpecies of tetrao, with a forked tail, fpotted with white underneath. It is a native of England, but very rare: the male is throughout of a very deep iron grey, without any variegation; and the female is alfo grey, but variegated with tranfverfe lines of black.

Moor's head, in the manege, &c. See the article Head.

Moor-hen, the englifh name of the gallinula or tringa. See Tringa.

Moor-stone, a valuable ftone, much ufed in the coarfer works of the prefent builders; being truly a white granite, of a marbly texture.

Moor-titling, in ornithology, a name by which many call the oenanthe. See the article Oenanthe.

MOORING, or moaring, in the fea-language, is the laying out the anchors of a fhip in a place where fhe can ride fecure.

Mooring acrofs, is laying out an anchor on each fide: and mooring along, is to have an anchor in a river and a hawfer on fhore.

When fhips are laid up in ordinary, or are under orders of fitting for the fea, the moorings are laid out in harbours; and confift of claws, pendent chains, cables, bridles, anchors, fwivels, jew's-harps, buoys, and chains.

MOOT, a difficult cafe argued by the young barrifters and ftudents at the inns of court, by way of exercife, the better to qualify them for practice, and to defend the caufes of their clients. This, which is called mooting, is the chief exercife of the inns of court. Particular times are appointed for the arguing moot-cafes: the place where this exercife is performed, was antiently called moot-hall; and there is a bailiff, or furveyor of the moots annually chofen by the bench, to appoint the moot-men for the inns of chancery, and to keep an account of the performance of exercifes.

MORA, a town of Spain, in the province of New-Caftile, eighteen miles fouth-eaft of Toledo.

MORAL, fomething belonging to manners, or the conduct of life. See the articles Good, Evil, &c.

Moral philosophy, the fame with ethics. See the article Ethics.

Moral sense, that whereby we perceive what is good, virtuous, and beautiful in actions, manners, and characters. See Sense, Action, Character, &c.

Moral of a fable. See Fable.

MORALITY, the fcience and doctrine of morals, otherwife called ethics. See the article ETHICS.

Morality may be defined to be the relation, conformity, or agreement of men's voluntary actions, to a rule, to which they are referred, and by which they are judged of. Thefe moral rules feem to be of three forts, with their different enforcements. 1. The divine law, whether known by the light of nature or the voice of revelation, which is the only true touchftone of moral rectitude, the confciences of men bearing witnefs either of the goodnefs or finfulnefs of their actions; that is, whether as duties or fins they are like to procure them happinefs, or mifery, from the hands of the Almighty. 2. The civil law, which is the rule fet by the commonwealth to the actions of thofe that belong to it: this rule no body overlooks, the rewards and punifhments being ready at hand to enforce it, extending to the protecting or taking away of the life, liberty, and eftate of thofe who obferve and difobey it. 3. The law of opinion and reputation, whereby virtue and praife, vice and blame, are ever found to accompany each other: now thofe who think not commendation and difgrace fufficient motives to engage mankind to accommodate themfelves to the opinions and rules of thofe with whom they converfe, feem little fkilled in the hiftory of mankind, fince moft people govern themfelves chiefly by this law of fafhion. See the article RELATION.

Moral philofophy contemplates human nature, its moral powers and connections, and from thefe deduces the laws of action: though it muft be confeffed, that different philofophers have eftablifhed different fyftems concerning the foundation of morality, which the reader will find under the article ETHICS.

According to Mr. Locke, the idea of a fupreme being, infinite in power, goodnefs, and wifdom, whofe workmanfhip we are, and on whom we depend, and the idea of ourfelves, as intelligent creatures, would; if duly confidered, afford fuch foundations of our duty and rules of action, as might place morality among the fciences capable of demonftration.

As to the reafons why the mathematical fciences have been thought more capable of demonftration than the ideas of good and evil, right and wrong, &c. they are thefe. 1. That the former can be reprefented by fenfible marks, as diagrams, which have a nearer correfpondence with them than any words. 2. Moral ideas are commonly more complex than thofe of figures; whence it happens, that their names are of more uncertain fignification; and befides, the mind cannot eafily retain thefe precife combinations fo perfectly, as is neceffary in the examination of the agreements and difagreements of feveral of them one with another. See the article KNOWLEDGE.

One part of thefe difadvantages in moral ideas, continues the fame great author, may in a good meafure be remedied by accurate definitions; fetting down that collection of fimple ideas which every term fhall ftand for, and then ufing the term fteadily for that precife collection. See the article DEFINITION.

MORANT POINT, the moft eafterly promontary of the ifland of Jamaica: weft long. 76° 30′, north lat. 18°.

MORASSE, a low, moift land, which receives the waters from the higher grounds without having any defcent to carry them off. See MARSH and MOSS.

MORAT, or MURTEN, a town of Switzerland, in the canton of Bern, fituated on the lake Morat, fifteen miles weft of Bern.

MORATUR, or DEMORATUR, in law, he demurs; a term ufed when one of the parties in a caufe demurs, and does not proceed in pleading, but refts upon the judgment of the court in fome particular point, either in relation to the fufficiency of the declaration, or the pleas of the contrary party; upon which the court, after taking fome time to argue and advife, determine the point.

MORAVA, a river of european Turky, that rifes in the mountain of Rodope, or Argentum, and falls into the Danube at Semendria, to the eaftward of Belgrade.

MORAVIA, a marquifate, or province in Bohemia, bounded by Silefia on the north-eaft, by Hungary and Auftria on the fouth; and by Bohemia on the northweft.

MORAVIANS, a fect of proteftants, who have been fettled for a confiderable time paft at Hernhuth, in Germany, and have of late years fpread themfelves over moft of our American colonies, as well as in feveral parts of England, where they are permitted to fettle by a late act of parliament. They have a kind of church-government peculiar to themfelves, and are commonly known by the

name of *Unitas Fratrum*, or *The Brethren*. They profess the utmost veneration for our blessed Saviour, whom they consider as their immediate Head and Director, enjoin the most implicit obedience to the rulers of their church, and are said to practice much brotherly love amongst one another. In short, they seem to be a meek, peaceable, and industrious kind of people. They have nevertheless been lately accused of several erroneous principles and practices, to which accusations they have either been totally silent, or given partial and unsatisfactory answers: but as these may proceed more from the weakness and enthusiasm of particular members than the constitution of their church itself, they perhaps think themselves less obliged to take notice of them. It were to be wished, however, that they would publish such a plain and distinct account of their œconomy both in civil and religious matters, as might effectually clear them of all suspicion of aiming at any thing inconsistent with the principles of the purest professors of Christianity.

MORAW, a river that rises in the north of Moravia, and after dividing Austria from Hungary, falls into the Danube, to the westward of Presburg.

MORBACH, or MURBACH, a town of Germany, in the circle of the upper Rhine, and landgraviate of Alsatia, forty miles south of Strasburg, subject to France.

MORBID, among physicians, signifies diseased or corrupt, a term applied either to an unsound constitution, or to those parts or humours that are infected by a disease. See the article DISEASE.

MORBILLI, the measles, in medicine. See the article MEASLES.

MORBUS, DISEASE, in medicine. See the article DISEASE.

MORDELLA, in zoology, a genus of the coleoptera class of insects, the antennæ whereof are slender, and have the last joint globose; most of the species have also legs, which serve them for leaping.

MOREA, the antient Peloponnesus, is a province of european Turky, and is a peninsula about one hundred and eighty miles long, and one hundred and thirty broad, bounded by the gulphs of Lepanto and Engia on the north; by the egean sea, or Archipelago, on the east; and by the Mediterranean on the south and west.

MORESK, or MORISCO, is a kind of painting, carving, *&c.* done after the manner of the moors; consisting of several grotesque pieces and compartments, promiscuously mingled, not containing any perfect figure of a man, or other animal; but a wild resemblance of birds, beasts, trees, *&c.*

Moresk-dances, vulgarly called morrice-dances, are those altogether in imitation of the moors, as sarabands, chacons, *&c.* which are generally performed with castanets or tambours.

MORETON, a market-town of Devonshire, twelve miles south-west of Exeter.

MORETON, is also a market-town of Glocestershire, twenty miles north-east of Glocester.

MORGAY, in ichthyology, the squalus with a variegated back, and with the belly fins concreted. See SQUALUS.

The head of this species is large, and of a depressed form; the eyes are large, and stand pretty high on the sides of the head; the nostrils are very conspicuous, they have each a double aperture; the mouth is on the under part of the rostrum, and opens transversely; the apertures of the gills are five, oblique, or nearly transverse openings on each side below the head, and reaching to the pectoral fins.

MORINA, in botany, a plant of the diandria-monogynia class, with a monopetalous flower, bilabiated at the limb: the seed is single, roundish, and coronated with the cup of the flower.

MORINDA, in botany, a genus of the pentandria-monogynia class of plants, with an infundibuliform monopetalous flower, divided into five segments at the limb: the fruit is a roundish berry, with an umbilicated point, and contains two elliptico-hemispherical seeds.

MORINELLUS, the DOTTEREL, in ornithology, a species of charadrius, with a ferrugineous breast, and a white ring round the neck. See CHARADRIUS.

MORISONA, a plant belonging to the polyandria-monogynia class, the flower of which consists of four oblong petals; and its fruit is a globose berry, containing a great many kidney-shaped seeds.

MORLACHIA, a province of Venice; having Dalmatia on the south, and lying between the provinces of Croatia and Bosnia.

MORLAIX, a port-town of France, in the province of Britany: west long. 4°, north lat. 48° 37′.

MORMYLUS, in ichthyology, the sparus with

with the upper jaw longeſt, and with twelve parallel tranſverſe black lines on each ſide. See the article SPARUS.

MORNING, the beginning of the day, the firſt appearance of light, or the time from midnight till noon.

MOROCCO, the capital of the kingdom of the ſame name in Africa; weſt long. 9°, north lat. 32°.

MOROCCO, *marroquin*, in commerce, a fine kind of leather, prepared of the ſkin of an animal of the goat kind, and imported from the Levant, Barbary, *&c.* The name was probably taken from the kingdom of Morocco, whence the manner of preparing it was borrowed, which is this: the ſkins being firſt dried in the hair, are ſteeped in clear water three days and nights; then ſtretched on a tanner's horſe, beaten with a large knife, and ſteeped afreſh in water every day till they be well come: then they are thrown into a large vat in the ground full of water, where quick-lime has been ſlaked, and there lie fifteen days; whence they are taken, and again returned every night and morning. Then they are thrown into a freſh vat of lime and water, and ſhifted night and morning for fifteen days longer; then rinſed in clear water, and the hair taken off on the leg with the knife, returned into a third vat and ſhifted as before for eighteen days; ſteeped twelve hours in a river, taken out, rinſed, put in pails, where they are pounded with wooden peſtles, changing the water twice; then laid on the horſe, and the fleſh taken off; returned into pails of new water, taken out, and the hair ſide ſcraped; returned into freſh pails, taken out, and thrown into a pail of a particular form, having holes at bottom: here they are beaten for the ſpace of an hour, and freſh water poured on from time to time; then being ſtretched on the leg, and ſcraped on either ſide, they are returned into pails of freſh water, taken out, ſtretched and ſewed up all round in manner of bags, leaving out the hinder legs as an aperture for the conveyance of a certain mixture.

The ſkins thus ſewed are put in lukewarm water, where dogs excrements have been diſſolved. Here they are ſtirred with long poles for half an hour, left at reſt a dozen, taken out, rinſed in freſh water, and filled by a tunnel with a preparation of water and ſumac, mixed and heated over the fire till ready to boil; and, as they are filled, the hind legs are ſewed up to ſtop the paſſage. In this ſtate they are let down into the veſſel of water and ſumac, and kept ſtirring for four hours ſucceſſively; taken out and heaped on one another; after a little time their ſides are changed; and thus they continue an hour and a half, till drained. This done, they are looſened, and filled a ſecond time with the ſame preparation, ſewed up again, and kept ſtirring two hours, piled up, and drained as before. This proceſs is again repeated, with this difference, that they are now ſtirred only a quarter of an hour; after which they are left till next morning, when they are taken out, drained on a rack, unſewed, the ſumac taken out, folded in two from head to tail, the hair-ſide outwards, laid over each other on the leg, to perfect their draining, ſtretched out and dried; then trampled under foot by two and two, ſtretched on a wooden table, what fleſh and ſumac remains ſcraped off, the hair-ſide rubbed over with oil, and that again with water.

Then they are wrung with the hands, ſtretched, and preſſed tight on the table with an iron-inſtrument like that of a currier, the fleſh ſide uppermoſt; then turned, and the hair-ſide rubbed ſtrongly over with a handful of ruſhes, to ſqueeze out as much of the oil remaining as poſſible. The firſt courſe of black is now laid on the hair-ſide, by means of a lock of hair twiſted and ſteeped in a kind of black dye, prepared of ſour beer, wherein pieces of old ruſty iron have been thrown. When half dried by hanging in the air, they are ſtretched on a table, rubbed over every way with a paumelle, or wooden-toothed inſtrument, to raiſe the grain, over which is paſt a light couche of water, then ſleeked by rubbing them with ruſhes prepared for the purpoſe. Thus ſleeked, they have a ſecond couche of black, then dried, laid on the table, rubbed over with a paumelle of cork, to raiſe the grain again; and, after a light couche of water, ſleeked over anew; and, to raiſe the grain a third time, a paumelle of wood is uſed.

After the hair-ſide has received all its preparations, the fleſh-ſide is pared with a ſharp knife for the purpoſe; the hair-ſide is ſtrongly rubbed over with a woollen cap, having before given it a gloſs with barberries, citron, or orange. The whole is finiſhed by raiſing the grain lightly, for the laſt time, with the paumelle of cork; ſo that they are now fit for the market.

 Morocco

Manner of preparing red MOROCCO: after ſteeping, ſtretching, ſcraping, beating, and rinſing, as before, they are at length wrung, ſtretched on the leg, and paſſed after each other into water where alum has been diſſolved. Thus alumed, they are left to drain till morning, then wrung out, pulled on the leg, and folded from head to tail, the fleſh inwards.

In this ſtate they receive their firſt dye, by paſſing them after one another into a red liquor, prepared with laque, and ſome other ingredients, which the maroquineers keep a ſecret. This they repeat again and again, till the ſkins have got their firſt colour; then they are rinſed in clear water, ſtretched on the leg, and left to drain twelve hours; thrown into water, into which white galls pulverized have been paſt through a ſieve, and ſtirred inceſſantly for a day with long poles; taken out, hung on a bar a-croſs the water all night, white againſt red, and red againſt white, and in the morning the water ſtirred up, and the ſkins returned into it for twenty-four hours.

MOROCHTHUS, in natural hiſtory, an indurated clay, called by us french-chalk; ſerving taylors and others to mark with. The antients eſteemed it as an aſtringent, preſcribing it in the colic, hæmorrhages, and other fluxes. See the article LAPIS.

MORON, a town of Spain, in the province of Andaluſia, thirty miles ſouth-eaſt of Seville.

MORPETH, a borough-town of Northumberland, fourteen miles north of Newcaſtle, which ſends two members to parliament.

MORPHEW, a leprous kind of ſcurf which ſometimes breaks out upon the ſkin, particularly about the forehead. See the article LEPROSY.

MORSE, in zoology, a name by which ſome call the hippopotamus. See the article HIPPOPOTAMUS.

MORT D'ANCESTOR, in law. See the article ASSISE *of mort d'anceſtor.*

MORTAIGN, a town of the Orleanois, in France: eaſt long. 50′, and north lat. 48° 40′.

MORTAIN, a town of Normandy, in France: weſt long. 50′, and north lat. 48° 49′.

MORTALITY, or *bills of* MORTALITY, properly denote weekly liſts of the perſons who die in any place.

In London, theſe bills are drawn up by the company of pariſh-clerks, and contain an account of the numbers, ages, diſeaſes, &c. of ſuch as die within the bills of mortality; that is, in London, Weſtminſter, and ten miles round.

The great diſparity between the births and burials in London, is owing to this, that the diſſenters of all ſorts baptize their children without ſending an account of them to the pariſh clerks; ſo that little dependance is to be had on theſe, with regard to calculating annuities for life.

Dr. Halley's table, grounded on the Breſlau bills of Mortality, is of much more authority: it ſhews alternately the age, and the number of perſons living of that age.

Age.	Perſons living.	Age.	Perſons living.	Age.	Perſons living.	Age.	Perſons living.
1	1000	22	586	43	417	64	202
2	855	23	579	44	407	65	192
3	798	24	573	45	397	66	182
4	760	25	567	46	387	67	172
5	732	26	560	47	377	68	162
6	710	27	553	48	367	69	152
7	692	28	546	49	357	70	142
8	680	29	539	50	346	71	131
9	670	30	531	51	335	72	120
10	661	31	523	52	324	73	109
11	653	32	515	53	313	74	98
12	646	33	507	54	302	75	88
13	640	34	499	55	292	76	78
14	634	35	490	56	282	77	68
15	628	36	481	57	272	78	58
16	622	37	472	58	262	79	49
17	616	38	463	59	252	80	4
18	610	39	454	60	242	81	34
19	604	40	445	61	232	82	28
20	598	41	436	62	222	83	23
21	592	42	427	63	212	84	20

By the help of this table, we can find what probability there is, that a man of a certain age, 30 for example, ſhall live 1, 2, 3, &c. years. Thus, againſt 30 we find 531, and underneath this 523, 515, &c. the meaning of which is, that out of 531 perſons living at the age of 30, there remain only 523, 515, &c. who attain the age of 31, 32, &c. reſpectively.

Hence ſuppoſing A, B, C, &c. to repreſent, reſpectively, the perſons living at a given age and the ſubſequent years; it is evident, that there being A perſons living of the given year, and only B perſons remaining after the firſt year, the probability that a perſon of the given

 age

age ſhall live one year, is meaſured by the fraction $\frac{B}{A}$; and, in the ſame manner, the probability that he ſhall live two years, is meaſured by the fraction $\frac{C}{A}$, and ſo on. Thus the probability that a perſon of 30 years of age ſhall live one year, is meaſured by $\frac{523}{531}$; that is, he has the odds of 523 to 8, or nearly 65 to 1, that he does not die in a year. So, likewiſe, to find the odds that any perſon does not die before he attain any propoſed age, the rule is this: ſubtract the number of the remaining perſons of the age propoſed, from thoſe of the firſt age, and that will ſhew the odds there is of the perſon's living or dying; as for inſtance, the odds that a man of 40 ſhall live 7 years, is found by ſubſtracting 377, the number of perſons of 47 years from 445, the number of perſons of 40 years, and the difference 68, is the number of perſons dying in that 7 years: hence the odds is 377 to 68, or $5\frac{1}{2}$ to 1, that a man of 40 does live ſeven years; and the like for any other number of years.

From what has been ſaid it appears, that the price of inſurance upon lives ought to be regulated; there being a great difference between inſuring the life of a man of 20, and that of another of 50 years of age; ſince it is 100 to 1 that the man of 20 dies not in a year; and but 38 to 1 for a man of 50 years of age. See the article LIFE.

MORTAR, a preparation of lime and ſand mixt up with water, which ſerves as a cement, and is uſed by maſons and bricklayers in building of walls of ſtone and brick.

The proportion of lime to ſand in making mortar, ought to be according to the goodneſs or badneſs of theſe materials, and is therefore rather to be regulated by the judgment of experienced workmen than by any ſtated proportion of materials. It is, however, neceſſary to obſerve, that the beſt ſand for making lime, according to Wolfius, is that which is coarſe and ſharp, ſo as to prick the hands when rubbed, and yet not earthy, and ſo as to foul the water it is waſhed in: and that the beſt lime for the ſame purpoſe is that made of the hardeſt ſtones. See the article LIME.

Beſides the common mortar uſed in laying ſtones, bricks, &c. there are ſeveral other kinds; as, 1. White mortar, uſed in plaſtering walls and ceilings, which are often firſt plaſtered with loam, and is made of ox or cow-hair mixed and tempered with lime and water without any ſand. The common allowance is one buſhel of hair to ſix of lime; the hair binds the mortar, holds it faſt together, and keeps it from cracking. 2. Mortar for furnaces, &c. is made with red clay wrought in water in which horſe-dung and chimney-ſoot has been ſteeped, by which a ſalt is communicated to the water, which binds the clay, and makes it fit to endure the fire: this clay ought not to be too fat, leſt it ſhould be ſubject to crack; nor too lean or ſandy, leſt it ſhould not bind enough. 3. Some workmen in metals, uſe a kind of mortar to plaſter over the inſide of the veſſels in which they refine their metals, to keep them from running out: this kind of mortar is made with quick-lime and ox-blood, the lime being firſt beaten to powder and ſifted, and afterwards mixed with the blood. 4. Mortar for ſun-dials on walls, may be made of lime and ſand tempered with linſeed-oil, or, for want of the latter, with ſkimmed milk; but oil is better. This ſpread upon the wall will become as hard as ſtone, and will endure the weather ſix times as long as the ordinary plaſter made of lime and hair with water. 5. For plaſtering the fronts of houſes in imitation of brick-work, ſome uſe a mortar made of ſharp ſand and lime, powder of brick and ſome red ochre: and timber-houſes, plaſtered over with this kind of mortar, look well though they have been done twenty or thirty years. 6. The mortar uſed in Italy for making water-courſes and ciſterns, and alſo in finiſhing or plaſtering of fronts is of two ſorts: the one is compoſed of lime and hogs-greaſe, mixt with the juice of figs, and the other is of the ſame ingredients, but has liquid pitch added to the reſt, and is firſt wet or ſlacked with wine, and then pounded or beaten with hogs greaſe and juice of figs. 7. An extraordinary good mortar for floors, walls, cielings, &c. may be made with ox-blood and fine clay tempered together. 8. And in buildings, one part of waſte ſoap-aſhes, mixed with another of lime and ſand, make a very durable mortar.

MORTAR-PIECE, a ſhort piece of ordnance, conſiderably thick and wide; ſerving to throw bombs, carcaſſes, fire-pots, &c. See plate of gunnery, fig. 4. which

4, which reprefents a mortar mounted on its carriage.

The ufe of mortars is thought to be older than that of cannon; they being employed in the wars in Italy to throw ftones and balls of red-hot iron, long before the invention of bombs; which, as Blondel informs us, were firft thrown at the fiege of Wachtendorch, in Guilderland, in 1588.

It was formerly the opinion of gunners, that only one certain charge of powder was requifite for each mortar, and that the horizontal range could not be altered but by changing the direction of the piece; but, at prefent, when a place lying in the fame horizontal plane with the mortar, is to be bombarded, they elevate the piece to 45°, and augment or diminifh the charge of powder until they can hit the mark. The following advantages introduced this practice: 1. The public powder is faved as much as poffible; becaufe, at a direction of 45°, a lefs velocity, and confequently a lefs charge of powder is required to make any horizontal range, than is neceffary to make the fame horizontal range at any other elevation. 2. In elevating mortars to their proper directions, gunners feldom come within a degree or two of the propofed elevation, both on account of the imperfection of the inftruments which they generally ufe for that purpofe, and the hurry they are in at that time. And in bombarding towns from fhips, it is fcarce poffible to come within two degrees of the defigned elevation, becaufe of the agitation of the veffel, which continually changes the direction of the mortar. But by raifing the mortar to 45°, the bad confequences of this inaccuracy of elevation are in a great meafure prevented, becaufe a fmall error above or below 45°, occafions a very inconfiderable error of amplitude.

For the fame reafons, alfo, places lying above or below the horizontal plane, paffing through the piece, are bombarded by directing the mortar fo as its axis may biffect the angle comprehended between a perpendicular to the horizon, at the point of projection, and a line drawn from that point to the mark aimed at; and then augmenting and diminifhing the charge of powder until the object be hit.

When the bufinefs, therefore, can be effectually done by this middle elevation, it ought certainly to be preferred to any other. However, in the courfe of a fiege it frequently happens, that feveral of the cafes mentioned under the article GUNNERY, are made ufe of either by the affailants or defendants. Whence we may infer, that though mortars are ofteneft, and moft fitly, ufed at 45° elevation, yet they ought not to be founded of one piece with their bed, becaufe fuch are not only very coftly but unweildy, and therefore unfit to be raifed to any defired elevation. See GUNNERY.

Mortars are moft fit for fervice when hung by trunnions and propped with quoins, efpecially if their carriages be fteady enough to prevent the effects of fudden recoiling.

In fhooting with mortars, the following general rules fhould be always obferved. 1. To meafure the diftance of the object aimed at. 2. That the bombs be of equal weight, otherwife the fhots will vary. 3. That the carriage be on an exact level, to prevent its leaping. 4. That the powder with which the piece is charged, be always of the fame ftrength and quantity. 5. That the charge be always equally rammed down. 6. That the wads be always of wood, tompions, or oakam. 7. That the fufees be frefh made the days on which they are to be ufed; and that they be of a compofition proportionable to the range of the fhot in the air, fo that the bomb may break at the very moment of, or foon after its fall; which compofition muft be fuch as not to be extinguifhed though it fall in water, but continue burning till the bomb breaks. See the article BOMB.

MORTARO, or MONTARA, a town of the dutchy of Milan, in Italy, twenty miles north-eaft of Cafal, and fubject to the king of Sardinia.

MORTGAGE, in law, a pledge or pawn of lands, tenements, &c. for money borrowed; fo called becaufe if the money is not paid at the day, the land dies to the debtor, and is forfeited to the creditor. The common method of making a mortgage, is by leafe for a long term of years, wherein a peppercorn rent has been ufually referved: or it may be made by affignment for a term, and by leafe and releafe. The creditor, who holds the eftate according to the condition of the deed, is called the mortgagee; but the mortgager, who is the perfon that makes the mortgage, generally keeps poffeffion of the land till failure is made in the payment of the mortgage-money;

money; in which cafe, though the mortgagee enters for non-payment, the mortgager has a right to the equity of redemption in the court of chancery, where he may call the mortgagee to an account for the profits of the land mortgaged.

In a mortgage is contained a provifo or covenant, that in cafe the money be paid on the day limited, the deed fhall thereupon be void: but on the mortgager's paying the intereft of the money, mortgages are frequently continued without difturbing the poffeffion. Where an old mortgage is affigned to another, it is to be taken for a new one from the time of the affignment; and as a mortgagee, where the mortgage is forfeited, is allowed intereft for his intereft, fo an affignee is to have it for all intereft due at the time of the affignment, which muft be accounted as principal whenever he comes to redeem the land: but yet an agreement made at the fame time with the original mortgager, will not make future intereft to be principal before any is become due. It has alfo been decreed, that where a mortgagee lends more money on bond to the mortgager, the latter fhall not be permitted to redeem, except he pay the money lent upon the bond, together with that on the mortgage; though if the mortgager mortgage the equity of redemption to another, the fecond mortgagee will not be affected by this bond; for this reafon, becaufe it is but a perfonal charge on the mortgager. By a late ftatute it is ordained, that when any action of ejectment is brought by a mortgagee, for the recovery of the poffeffion of the lands or tenements, *&c.* mortgaged, and there is no fuit in equity for foreclofing or redeeming the equity of redemption, in cafe the perfon intitled to redeem fhall, pendente lite, or pending the action, bring all the principal and intereft due, with cofts, into court, it fhall be taken as a full fatisfaction and difcharge of the mortgage, and the mortgagee fhall thereon be obliged to reconvey the land, *&c.* and deliver up all deeds, *&c.* 7 Geo. 2. c. 201.

MORTIER, an enfign of dignity, borne by the chancellor, and grand prefidents of the parliaments of France. That borne by the chancellor, is a piece of cloth of gold, edged and turned up with ermine; and that of the firft prefident is a piece of black velvet edged with a double row of gold lace, while that of the other prefidents is only edged with a fingle row. This they formerly carried on their heads, as they do ftill in grand ceremonies, fuch as the entry of the king: but, ordinarily, they carry them in the hand.

MORTIFICATION, in medicine, the fame with fphacelus. See SPHACELUS.

MORTISE, or MORTOISE, in carpentry, *&c.* a kind of joint, wherein a hole of a certain depth is made in a piece of timber, which is to receive another piece called a tenon.

MORTMAIN, in law, is the alienation of lands or tenements to any religious houfe, corporation, or fraternity, and their fucceffors. Lands alienated in mortmain are different from others, for they never revert to the donor, or to any temporal or common ufe; on which account the lords by fuch alienation lofe their efcheats, and many fervices that were formerly due to them; as bodies politic never die, nor can perform perfonal fervice, commit treafon, felony, or the like. By the ftatute of mortmain lately made, it is enacted, that no manors, lands, *&c.* fhall be given or granted to, or fettled upon any perfons, bodies politic, *&c.* for any eftate whatfoever, or charged in truft for charitable ufes, unlefs it be done by deed indented and fealed twelve months at leaft before the donor's death, and inrolled in chancery within fix months after executed. The two Univerfities, and the colleges of Eaton, Weftminfter, *&c.* are excepted out of this act. 9 Geo. II. c. 36.

MORTUARY, in the ecclefiaftical law, is a gift left by a man at his death to his parifh church, in recompence of perfonal tythes omitted to be paid in his lifetime: or it is that beaft, or other cattle, which, after the death of the owner, by the cuftom of the place, is due to the parfon or vicar, in lieu of tithes or offerings forgot, or not well and truly paid by him that is dead.

A mortuary is not properly due to an ecclefiaftical incumbent from any but thofe of his own parifh: but by cuftom, in fome places, it is paid to the incumbents of other parifhes, when a corpfe is carried through them. The bifhops of Bangor, Landaff, St. David's, *&c.* had formerly mortuaries of priefts: and it was cuftomary in the diocefe of Chefter, for the bifhop to have a mortuary, on the death of every prieft dying within the archdeaconry of Chefter, of his beft beaft, faddle,

ſaddle, and bridle, with his beſt cloak, hat, and upper garment under the gown. Mortuaries are not now paid in kind; but money is to be given in lieu of them. By a ſtatute of Hen. VIII. they are to be paid as follows: he that dies poſſeſſed of moveable goods to the value of 40l. or above, is to pay 10s. he that dies poſſeſſed of goods of 30l. value, and under 40l. is to pay 6s. 8d. and ſo on in proportion: but if the goods are under the value of 6l. 13s. 4d. after the deceaſed's debts are paid, no mortuary is to be demanded. It is to be obſerved, that no mortuaries are to be paid, except in thoſe places where they are due by cuſtom.

MORTUUM CAPUT. See the article CAPUT MORTUUM.

MORVIEDRO, or MURVIEDRO, a town of Spain, in the province of Valencia, eighteen miles north of the city of Valencia.

MORUS, the MULBERRY TREE, in botany, &c. See MULBERRY.

MOSAIC, or MOSAIC-WORK, an aſſemblage of little pieces of glaſs, marble, precious ſtones, &c. of various colours, cut ſquare, and cemented on a ground of ſtucco, in ſuch a manner as to imitate the colours and degradations of painting.

Method of performing MOSAIC-WORK of glaſs is this: they provide little pieces of glaſs, of as many different colours and ſizes as poſſible. See the article *Painting in* GLASS.

Now in order to apply theſe ſeveral pieces, and out of them to form a picture, they in the firſt place procure a cartoon or deſign to be drawn; this is transferred to the ground or plaſter by calking, as in painting in freſco. See the article FRESCO.

As this plaſter is to be laid thick on the wall, and therefore will continue freſh and ſoft a conſiderable time, ſo that there may be enough prepared at once, to ſerve for as much work as will take up three or four days.

This plaſter is compoſed of lime, made of hard ſtone, with brick-duſt very fine, gum tragacanth, and whites of eggs: when this plaſter has been thus prepared and laid on the wall, and made the deſign of what is to be repreſented; they take out the little pieces of glaſs with a pair of plyers, and range them one after another, ſtill keeping ſtrictly to the light, ſhadow, different teints and colours repreſented in the deſign before; preſſing or flatting them down with a ruler, which ſerves both to ſink them within the ground, and to render the ſurface even.

Thus in a long time, and with a great deal of labour, they finiſh the work, which is ſtill the more beautiful, as the pieces of glaſs are more uniform, and ranged at an even height.

Some of theſe pieces of moſaic-work are performed with that exactneſs, that they appear as ſmooth as a table of marble, and as finiſhed and maſterly as a painting in freſco; with this advantage, that they have a fine luſtre, and will laſt ages.

The fineſt works of this kind that have remained till our time, and thoſe by whom the moderns have retrieved the art, which was in a manner loſt, are thoſe in the church of St. Agnes, formerly the temple of Bacchus at Rome; and ſome at Piſa, Florence, and other cities of Italy. The moſt eſteemed among the works of the moderns are thoſe of Joſeph Pine, and the chevalier Lanfranc in the church of St. Peter at Rome: there are alſo very good ones at Venice.

Method of performing MOSAIC-WORK of marble and precious ſtones is this: the ground of moſaic-works, wholly marble, is uſually a maſſive marble, either white or black. On this ground the deſign is cut with a chiſſel, after it has been firſt calqued. After it has been cut of a conſiderable depth, *i. e.* an inch or more, the cavities are filled up with marble of a proper colour, firſt faſhioned according to the deſign, and reduced to the thickneſs of the indentures with various inſtruments. To make the pieces thus inſerted into the indentures cleave faſt, whoſe ſeveral colours are to imitate thoſe of the deſign, they uſe a ſtucco, compoſed of lime and marble-duſt; or a kind of maſtic, which is prepared by each workman, after a different manner peculiar to himſelf.

The figures being marked out, the painter or ſculptor himſelf draws with a pencil the colours of the figures, not determined by the ground, and in the ſame manner makes ſtrokes or hatchings in the place, where ſhadows are to be; and after he has engraven with the chiſſel all the ſtrokes thus drawn, he fills them up with a black maſtic, compoſed partly of burgundy-pitch poured on hot; taking off afterwards what is ſuperfluous, with a piece of ſoft ſtone or brick, which, together

g-ther

gether with water and beaten cement, takes away the maftic, polifhes the marble, and renders the whole fo even that one would imagine it only confifted of one piece.

This is the kind of mofaic-work, that is feen in the pompous church of the invalids at Paris, and the fine chapel at Verfailles, with which fome intire apartments of that palace are incruftated.

As for mofaic-work of precious ftones, other and finer inftruments are required than thofe ufed in marble; as drills, wheels, *&c.* ufed by lapidaries and engravers on ftone. As none but the richeft marbles and ftones enter this work, to make them go the further, they are fawn into the thinneft leaves imaginable, fcarce exceeding half a line in thicknefs; the block to be fawn is faftened firmly with cords on the bench, and only raifed a little on a piece of wood, one or two inches high. Two iron-pins, which are on one fide the block, and which ferve to faften it, are put into a vice contrived for the purpofe, and with a kind of faw or bow, made of fine brafs-wire, bent on a piece of fpongy wood, together with emery fteeped in water, the leaf is gradually fafhioned by following the ftroke of the defign, made on paper, and glued on the piece. When there are pieces enough faftened to form an intire flower, or fome other part of the defign, they are applied to the ground.

The ground which fupports this mofaic-work is ufually of free-ftone. The matter with which the ftones are joined together, is a maftic, or kind of ftucco, laid very thin on the leaves as they are fafhioned; and this being done the leaves are applied with plyers.

If any contour, or fide of a leaf, be not either fquared or rounded fufficiently, fo as to fit the place exactly, into which it is to be inferted, when it is too large, it is to be brought down with a brafs-file or rafp; and if it be too little, it is managed with a drill and other inftruments ufed by lapidaries.

Mofaic-work of marble is ufed in large works as in pavements of churches, bafilics, and palaces; and in the incruftation and vaneering of the walls of the fame edifices.

As for that of precious ftones, it is only ufed in fmall works, as ornaments for altar-pieces, tables for rich cabinets, precious ftones being fo very dear.

Manner of performing MOSAIC-WORK *of gypfum.* Of this ftone calcined in a kiln, and beaten in a mortar, and fifted, the french workmen make a fort of artificial marbles, imitating precious ftones, and of thefe they compofe a kind of mofaic-work, which does not come far fhort, either of the durablenefs or the vivacity of the natural ftones; and which befides has this advantage, that it admits of continued pieces or paintings of intire compartiments without any vifible joining.

Some make the ground of plafter of Paris, others of free-ftone. If it be of plafter of Paris, they fpread it in a wooden frame, of the length and breadth of the work intended, and in thicknefs about an inch and a half. This frame is fo contrived, that the tenons being only joined to the mortifes by fingle pins, they may be taken afunder, and the frame be difmounted, when the plafter is dry. The frame is covered on one fide with a ftrong linen-cloth, nailed all round, which being placed horizontally with the linen at the bottom, is filled with plafter paffed through a wide fieve. When the plafter is half dry, the frame is fet up perpendicularly, and left till it is quite dry; then it is taken out, by taking the frame to pieces.

In this mofaic, the ground is the moft important part. Now in order to the preparation of this fifted gypfum, which is to be applied on this ground, it is diffolved and boiled in the beft englifh glue, and mixt with the colour that it is to be of, then the whole is worked up together into the ufual confiftence of plafter; and then is taken and fpread on the ground five or fix inches thick. If the work be fuch, as that mouldings are required, they are formed with gouges and other inftruments.

It is on this plafter, thus coloured like marble or precious ftone, and which is to ferve as a ground to a work, either of lapis, agate, alabafter, or the like, that the defign to be reprefented is drawn; having been firft pounced or calqued. To hollow or imprefs the defign, they ufe the fame inftruments that fculptors do; the ground whereon they are to work not being much lefs hard than the marble itfelf. The cavities being thus made in the ground, are filled up with the fame gypfum boiled in glue, only differently coloured, and thus are the different colours of the original reprefented. In order that the neceffary colours and teints

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may be ready at hand, the quantities of the gypsum are tempered with the several colours in pots.

After the design has been thus filled and rendered visible, by half polishing it with brick and soft stone, they go over it again, cutting such plates as are either to be weaker or more shadowed, and filling them with gypsum; which work they repeat, 'till all the colours being added one after the other, represent the original to the life.

When the work is finished, they scour it with soft stone, sand, and water; after that, with a pumice-stone; and in the last place polish it with a wooden mullet and emery. Then, lastly, they give it a lustre, by smearing it over with oil, and rubbing it a long time with the palm of the hand, which gives it a lustre, no ways inferior to that of natural marble.

If you would only make a variegated table, or other work, of several colours, without mosaic-figures, the process is somewhat different.

In this case, you are to prepare colours separately in bowls, as many as nature shews in the marble to be imitated; and after you have incorporated them with gypsum and glue-water, take a trowel full of each, and dispose them in a trough, without any order, then without mingling them, and only by cutting or crossing the gypsum of each trowel, once with each of the rest, they give them that beautiful confusion, which renders natural marble valuable. Of these you may make tables, or lay them in a mould according to the work to be done.

Mosaic-work of wood is more properly called marquetry. See MARQUETRY.

MOSAMBIQUE, the capital of a province of the same name in Zanguebar, in Africa, situated on an island at the mouth of the river Mosambique: east long. 40°, south lat. 15°.

MOSBACH, or MORSBACH, a town of Germany, in the palatinate of the Rhine, sixteen miles east of Heidelburg.

MOSCHUS, the MUSK-ANIMAL, a genus of quadrupeds of the order of the pecora, having no horns; the canine teeth of the upper jaw are exerted. Of this genus there is only one known species, which is the animal that produces the perfume from which it is named. See the article MUSK.

This creature when full grown is three feet in length, from the tip of the nose to the rump; the head is oblong, and the anterior part much like the greyhound's; the ears are large and erect, they resemble those of the rabbit, and are equal in length to the diameter of the forehead; the tail is not more than two inches in length, and the creature always carries it erect; the body is tolerably fleshy, and rounded; the legs about a foot in length, and very robust; the feet deeply divided, each into two claws in the anterior part, and as many heels behind. The fur on the head and that on the legs is about half an inch long, that on the belly is an inch and a half, and that which grows on the back three inches; these hairs are thicker than in any other known animal, and are variegated, from the base to the extremity, with distinct spaces of brown and white: the vessel or bag in which the perfume called musk is contained, is three inches long and two broad, and hangs under the belly, protuberating near three quarters of an inch beyond the surface.

MOSCOW, the capital of the province of the same name in Muscovy, situated on the river Moscowa, 360 miles south-east of Petersburg: east long. 38°, north lat. 55° 45'.

MOSCOWA, a river which rises in the west part of the province of Muscow, and falls into the river Ocka at Kolomna.

MOSELLE, a river of Germany, which rises in the mountains of Vauge, in Lorrain, and running through that dutchy and the electorate of Triers, falls into the Rhine at Coblentz.

MOSKITO, a country of North America, situated between 85° and 88° of west longitude, and between 13° and 15° of north latitude; having the north-sea, on the north and east; Nicaragua, on the south; and Honduras on the west.

MOSPURG, or MOSBURG, a town of Germany, in the circle of Bavaria, situated at the confluence of the rivers Iser and Amburg, thirty miles north-east of Munich.

MOSQUE, a temple, or place of religious worship, among the mahometans.

All mosques are square buildings, generally built with stone; before the chief gate there is a square court, paved with white marble, and low galleries round it, whose roof is supported by marble pillars. In these galleries the Turks wash themselves before they go into the mosque. In each mosque there is a great number of lamps; and be-

 tween

tween thefe, hang many cryftal rings, oftriches eggs, and other curiofities, which, when the lamps are lighted, make a fine fhew. As it is not lawful to enter the mofques with fhoes or ftocking on, the pavements are covered with pieces of ftuff fewed together, each being wide enough to hold a row of men kneeling, fitting, or proftrate. The women are not allowed to enter the mofque, but ftay in the porches without. About every mofque there are fix high towers, called minarets, each of which has three little open galleries, one above another: thefe towers, as well as the mofques, are covered with lead, and adorned with gilding and other ornaments; and from thence, inftead of a bell, the people are called to prayer by certain officers appointed for that purpofe. Moft of the mofques have a kind of hofpital belonging to them, in which travellers, of what religion foever, are entertained during three days. Each mofque has alfo a place called Tarbé, which is the burying-place of its founders: within which is a tomb fix or feven feet long, covered with green velvet or fattin, at the ends of which are two tapers, and round it feveral feats for thofe who read the koran, and pray for the fouls of the deceafed.

MOSS, *mufcus*, in botany, a very numerous order of plants, belonging to the cryptogamia clafs, the fructification of which is but little underftood. Linnæus, indeed, has attempted to arrange them according to what he takes to be the parts of generation, many of which he acknowledges to be wanting. Hence in the defcription of fuch imperfect plants, it becomes neceffary to diftinguifh them according to their general habit and ftructure.

Moffes, therefore, may be arranged under the following fubdivifions, 1. Such as confift of tender flexible filaments, as byffus and conferva. 2. Such as confift of a mere foliaceous or gelatinous matter, as phyllona, ulva, &c. 3. Such as confift of firm and fomewhat rigid ftalks, as ufnea, platyfma, &c. 4. Such as confift merely of a dry, cruftaceous, or elfe of a gelatinous matter, as placodium. 5. Such as produce capfules, covered with opercula, as bryum, polytrichum, fphagnum, mnium, &c. 6. Such as produce capfules without pedicles, and without calyptræ, as lycopodium, trifpermium, felago, &c. 7. Such as confift of foliaceous matter, with evident fructifications arifing from it, as marchantia, jungermannia, anthoceros, &c. See BYSSUS, CONFERVA, &c.

Moffes are of confiderable ufe in medicine; ufnea is efteemed a good deficcative and aftringent; the cup-mofs is recommended in the chin-cough; the grey ground-lichen, or liverwort, againft the bite of a mad-dog; and other fpecies, in other diforders, as mentioned under their refpective heads.

Mofs is frequently very injurious to fruit-trees, which grow upon cold barren foils, or where they are fo clofe planted as to exclude the free accefs of the air: the only remedy, in fuch cafes, is to cut down part of the trees, and to plough up the ground between thofe left remaining; and in the fpring-feafon, in moift weather, you fhould with an iron-inftrument made a little hollow, the better to furround the branches of the trees, fcrape off the mofs, carrying it off the place; and by two or three times thus cleanfing them, together with carefully ftirring the ground, it may be entirely deftroyed from the trees; but unlefs part of the trees are cut down, and the ground be well ftirred, the rubbifh of the mofs will fignify little.

If the trees are covered with mofs, on account of the drynefs of the ground, the proper remedy is to lay mud, from the bottom of a river or pond, pretty thick about their roots.

MOSS is alfo a name given to boggy grounds in many parts of the kingdom. Thefe confift of a turfy furface, below which is a black, moift, fpongy earth, which being dug up with fpades fomewhat in the form of bricks, and dried, is what they call peats, ufed as fuel in feveral parts; and the upper fcurf, being cut and dried, makes turfs, another coarfer fort of fuel.

Wall-MOSS, *bryum*, in botany. See the article BRYUM.

MOSTRA, in the italian mufic, a mark at the end of a line or fpace, to fhew that the firft note of the next line is in that place: and if this note be accompanied with a fharp or flat, it is proper to place thefe characters along with the moftra. Alfo if in a thorough-bafs this firft note have any cyphers, thefe cyphers fhould be put along with the moftra, at the end of the preceding ftaff. And, laftly, if the part change its cleff with the firft note, the cleff ought to be marked

ed along with the moſtra, in the ſame manner.

The moſtra is of conſiderable uſe, eſpecially in quick motions, as it prepares the player for what is to follow.

MOSUL, or MOUSUL. See MOUSUL.

MOTACILLA, in ornithology, a numerous genus of birds, of the order of the paſſeres, diſtinguiſhed by a ſtraight beak, of a ſubulated figure, and a lacerated tongue.

To this genus belong the common wagtail, the wheat-ear, nightingale, redſtart, wren, &c. See the articles WAGTAIL, WHEAT EAR, &c.

MOTAZALITES, the name of a famous ſect among the mahometans, properly ſignifying ſeparatiſts.

The motazalites are not accounted orthodox muſſulmen, as they believe the alkoran to be created and not eternal; and beſides aſſert, that there are no attributes in God diſtinct from his eſſence.

MOTE, in law-books, ſignifies court or convention, as a ward-mote, burghmote, ſwain-mote, &c. See the article WARD-MOTE, &c.

MOTETTO, in the italian muſic, a ſort of church-muſic compoſed with much art and ingenuity, from one to eight parts, with or without inſtruments, and uſually accompanied with a thorough-baſs.

MOTH, *tinea*, or *phalæna*, in zoology. See the article PHALÆNA.

MOTHER, *mater*, a term of relation, denoting a woman who hath born a child. See the article DELIVERY.

The queen mother, is the ſame with what we call queen dowager. See QUEEN.

MOTHER is alſo uſed figuratively, to denote whatever gives origin to other things of the ſame kind: thus we ſay a mother-church, a mother-tongue or language, &c. See the articles CHURCH and LANGUAGE.

Fits of the MOTHER, in medicine, the ſame with what is otherwiſe called hyſterics. See the article HYSTERICS.

MOTION, is defined to be the continued and ſucceſſive change of place. See the article COMMUNICATION *of Motion*.

There are three general laws of motion. 1. That a body always perſeveres in its ſtate of reſt, or of uniform motion in a right line, till by ſome external force it be made to change its ſtate: for as body is paſſive in receiving its motion, and the direction of its motion, ſo it retains them, or perſeveres in them without any change, till it be acted on by ſomething external. From this law it appears, why we inquire not, in philoſophy, concerning the cauſe of the continuation of motion or reſt in bodies, which can be no other than their inertia; but if a motion begin, or if a motion already produced is either accelerated or retarded, or if the direction of the motion is altered, an inquiry into the power or cauſe that produces this change is a proper ſubject of philoſophy. 2. The ſecond general law of motion is, that the change of motion is proportional to the force impreſſed, and is produced in the right line in which that force acts. When a fluid acts upon a body, as water or air upon the vanes of a mill, or wind upon the ſails of a ſhip, the acceleration of the motion is not proportional to the whole force of thoſe fluids, but to that part only which is impreſſed upon the vanes or ſails, which depends upon the exceſs of the velocity of the fluid above the velocity which the vane or ſail has already acquired: for if the velocity of the fluid be only equal to that of the vane or ſail, it juſt keeps up with it, but has no effect either to advance or retard its motion. Regard muſt always be had to the direction in which the force is impreſſed, in order to determine the change of motion produced by it: thus, when the wind acts obliquely with reſpect to the direction of a ſhip, the change of her motion is firſt to be eſtimated in the direction of the force impreſſed; and thence, by a proper application of mechanical and geometrical principles, the change of the motion of the ſhip in her own direction is to be deduced. 3. The third general law of motion is, that action and re-action is equal, with oppoſite directions, and are to be eſtimated always in the ſame right line. Body not only never changes its ſtate of itſelf, but reſiſts by its inertia every action that produces a change in its motion: hence when two bodies meet, each endeavours to perſevere in its ſtate, and reſiſts any change; the one acquires no new motion, but what the other loſes in the ſame direction; nor does this laſt loſe any force, but what the other acquires; and hence, though by their colliſion, motion paſſes from the one to the other, yet the ſum of their motions, eſtimated in a given direction, is preſerved the ſame, and is unalterable by their mutual actions upon each other.

All motion may be conſidered abſolutely

or relatively. Abſolute or real motion, ſays Mr. Maclaurin, is when a body changes its place in abſolute ſpace; and relative motion, is when a body changes its place only with relation to other bodies.

From the obſervation of nature, every one knows that there is motion; that a body in motion perſeveres in that ſtate, till by the action of ſome power it is neceſſitated to change it; that it is not in relative or apparent motion in which it perſeveres, in conſequence of its inertia, but in real or abſolute motion. Thus the apparent diurnal motion of the ſun and ſtars would ceaſe, without the leaſt power or force acting upon them, if the motion of the earth was ſtopt; and if the apparent motion of any ſtar was deſtroyed by a contrary motion impreſſed upon it, the other celeſtial bodies would ſtill appear to perſevere in their courſe. See the article INERTIA.

To make this matter ſtill plainer, Mr. Martin obſerves, that ſpace is nothing but an abſolute and infinite void, and that the place of a body is that part of the immenſe void which it takes up or poſſeſſes: and this place may be conſidered abſolutely, or in itſelf, in which caſe it is called the abſolute place of the body; or elſe with regard to the place of ſome other body, and then it is called the relative or apparent place of the body.

Now as a motion is only the change of place in bodies, it is evident that it will come under the ſame diſtinction of abſolute and relative or apparent. All motion is in itſelf abſolute, or the change of abſolute ſpace; but, when the motions of bodies are conſidered and compared with each other, then are they relative and apparent only: they are relative, as they are compared to each other; and they are apparent only, inſomuch that not their true or abſolute motion, but the ſum or difference of the motions only is perceivable to us.

In comparing the motions of bodies we may conſider them as moving both the ſame way, or towards contrary parts: in the firſt caſe, the difference of motion is only perceived by us; in the latter, the ſum of the motions. Thus, for example, ſuppoſe two ſhips, A and B, ſet ſail from the ſame port upon the ſame rhumb, and that A ſails at the rate of five miles per hour, and B at the rate of three: here the difference of the velocity (*viz.* two miles per hour) is that by which the ſhip A will appear to go from the ſhip B forwards, or the ſhip B will appear at A to go with the ſame velocity backwards, to a ſpectator in either reſpectively.

If the two ſhips, A and B, move with the ſame degree of velocity, then will the difference be nothing, and ſo neither ſhip will appear to the other to move at all. Hence it is, that though the earth is continually revolving about its axis, yet, as all objects on its ſurface partake of the ſame common motion, they appear not to move at all, but are relatively at reſt.

If two ſhips, A and B, with the degrees of velocity as above, meet each other, the one will appear to the other to move with the ſum of both velocities, *viz.* at the rate of eight miles per hour; ſo that in this caſe the apparent motion exceeds the true, as in the other it fell ſhort of it. Hence the reaſon why a perſon, riding againſt the wind, finds the force of it much greater than it really is, whereas, if he rides with it, he finds it leſs.

The reaſon of all theſe phænomena of motion will be evident, if we conſider we muſt be abſolutely at reſt, if we would diſcern the true or real motions of bodies about us. Thus a perſon on the ſtrand will obſerve the ſhips ſailing with their real velocity; a perſon ſtanding ſtill will experience the true ſtrength and velocity of the wind; and a perſon, placed in the regions between the planets, will view all their true motions, which he cannot otherwiſe do, becauſe in all other caſes the ſpectator's own motion muſt be added to or ſubtracted from that of the moving body, and the ſum or difference is therefore the apparent or relative motion, and not the true.

Motion is alſo either equable or accelerated.

Equable motion is that by which a body paſſes over equal ſpaces in equal times.

Accelerated motion is that which is continually augmented or increaſed, as retarded motion is that which continually decreaſes; and, if the increaſe or decreaſe of motion be equal in equal times, the motion is then ſaid to be equally accelerated or retarded.

Equable motion is generated by a ſingle impetus or ſtroke; thus the motion of a ball from a cannon is produced by the ſingle action of the powder in the firſt moment, and, therefore, the velocity it firſt ſets out with, would always continue the ſame, were it void of gravity; and

and to move in an unrefifting medium; which, therefore, would be always equable, or fuch as would carry it through the fame length of fpace in every equal part of time.

Hence we may determine the theorems for the expreffions of the time (T) the velocity (V) and the fpace (S) paffed over in equable or uniform motion very eafily thus:

If the time be given, or the fame, the fpace paffed over will be as the velocity, *viz.* S : V; that is, with twice the velocity, twice the fpace; with three times the velocity, three times the fpace, will be paffed over in the fame time, and fo on.

If the velocity be given, or remain the fame, then the fpace paffed over will be as the time, *viz.* S : T; that is, it will be greater or lefs, as the time is fo.

But if neither the time nor velocity be given or known, then will the fpace be in the compound ratio of both, *viz.* S : T V. Hence, in general, fince S : T V, we have $V : \frac{S}{T}$; that is, the velocity is always directly as the fpace, and inverfely as the time. And alfo $T : \frac{S}{V}$; that is, the time is as the fpace directly, and as the velocity inverfely; or, in other words, it increafes with the fpace, and decreafes with the velocity.

If, therefore, in any rectangle, one fide reprefent the time, and the other fide the velocity, it is evident that the area of the faid rectangle will reprefent the fpace paffed over by an uniform motion in that time, and with that velocity.

Accelerated motion is produced by a conftant impulfe of power which keeps continually acting upon the body, as that of gravity which produces the motion of falling bodies; which fort of motion is conftantly accelerated, becaufe gravity every moment adds a new impulfe, which generates a new degree of velocity; and, the velocity thus increafing, the motion muft be quickened each moment, or fall fafter and fafter, the lower it falls.

In like manner a body thrown perpendicularly upward, as a ball from a cannon, will have its motion continually retarded, becaufe gravity acts conftantly upon it in a direction contrary to that given it by the powder; fo that its velocity upwards muft be continually diminifhed, and fo its motion as continually retarded, till at laft it be all deftroyed. The body has then attained its utmoft height, and is for a moment motionlefs, after which it begins to defcend with a velocity in the fame manner accelerated, till it comes to the earth's furface. See the article ACCELERATION.

Since the momentum (M) of a body is compounded of the quantity of matter (Q), and the velocity (V), we have this general expreffion $M = QV$, for the force of any body A; and fuppofe the force of another body B be reprefented by the fame letters in italics, *viz.* $\mathcal{M} = \mathcal{Q}\mathcal{V}$.

Let the two bodies A and B in motion impinge on each other directly; if they tend both the fame way, the fum of their motions towards the fame part will be $QV + \mathcal{Q}\mathcal{V}$. But if they tend towards contrary parts, or meet, then the fum of their motions towards the fame part will be $QV - \mathcal{Q}\mathcal{V}$; for fince the motion of one of the bodies is contrary to what it was before, it muft be connected by a contrary fign. Or thus; becaufe, when the motion of B confpires with that of A, it is added to it; fo, when it is contrary, it is fubducted from it, and the fum or difference of the abfolute motions is the whole relative motion, or that which is made towards the fame part. Again, this total motion towards the fame parts, is the fame both before and after the ftroke, in cafe the two bodies A and B, impinge on each other; becaufe, whatever change or motion is made in one of thofe bodies by the ftroke, the fame is produced in the other body towards the fame part; that is, as much as the motion of B is increafed or decreafed towards the fame part by the action of A, juft fo much is the motion of A diminifhed or augmented towards the fame part by the equal re-action of B, by the third law of motion.

In bodies not elaftic, let x be the velocity of the bodies after the ftroke (for, fince we fuppofe them not elaftic, there can be nothing to feparate them after collifion; they muft therefore both go on together, or with the fame celerity). Then the fum of the motions after collifion will be $Qx + \mathcal{Q}x$; whence, if the bodies tend the fame way, we have $QV + \mathcal{Q}\mathcal{V} = Qx + \mathcal{Q}x$, or if they meet, $QV - \mathcal{Q}\mathcal{V} = Qx + \mathcal{Q}x$; and accordingly $\frac{QV + \mathcal{Q}\mathcal{V}}{Q + \mathcal{Q}} = x$, or $\frac{QV - \mathcal{Q}\mathcal{V}}{Q + \mathcal{Q}} = x$.

If

If the body (B) (plate CLXXXIII. fig. 1. n° 1.) be at reſt, then $V=0$, and the velocities of the bodies after the ſtroke will be $\frac{Q\mathrm{V}}{Q+\mathcal{Q}}=x$.

Thus if the bodies be equal (*viz.* $Q=\mathcal{Q}$, *ibid.* n° 1.) and A with 10 degrees of velocity impinge on B at reſt; then $\frac{Q\mathrm{V}}{Q+\mathcal{Q}}=\frac{10}{2}=5=x$. If $Q=\mathcal{Q}$, and $\mathrm{V}:V::10:6$ (*ib.* n° 2.) we have $\frac{Q\mathrm{V}+\mathcal{Q}V}{Q+\mathcal{Q}}=\frac{16}{2}=8=x$, the velocity after the ſtroke.

If the bodies are both in motion, and tend the contrary way; then when $Q=\mathcal{Q}$ (*ibid.* n° 3.) and $\mathrm{V}=V$, it is plain $\frac{Q\mathrm{V}-\mathcal{Q}V}{Q+\mathcal{Q}}=0=x$; that is, the bodies which meet with equal bulks and velocities, will deſtroy each other's motion after the ſtroke, and remain at reſt. If $Q=\mathcal{Q}$ (*ibid.* n° 4.) but $\mathrm{V}:V::6:14$, then $\frac{Q\mathrm{V}-\mathcal{Q}V}{Q+\mathcal{Q}}=\frac{-8}{2}=-4=x$; which ſhews that equal bodies meeting with unequal velocities, they will, after the ſtroke, both go on the ſame way which the moſt prevalent body moved before.

If the velocity $\frac{Q\mathrm{V}\pm\mathcal{Q}V}{Q+\mathcal{Q}}$ be multiplied by the quantities of matter Q and $\mathcal{Q}$, we ſhall have $\frac{Q^2\mathrm{V}\pm Q\mathcal{Q}V}{Q+\mathcal{Q}}=$ the momentum of A after the ſtroke; and $\frac{Q\mathrm{V}\mathcal{Q}\pm\mathcal{Q}^2V}{Q+\mathcal{Q}}=$ the momentum B: therefore $Q\mathrm{V}-\frac{Q^2\mathrm{V}\pm Q\mathcal{Q}V}{Q+\mathcal{Q}}=\frac{Q\mathcal{Q}\mathrm{V}\pm\mathcal{Q}QV}{Q+\mathcal{Q}}=\frac{Q\mathcal{Q}}{Q+\mathcal{Q}}\times\overline{\mathrm{V}\pm V}=$ the quantity of the motion loſt in A after the ſtroke, and conſequently is equal to what is gained in B, as may be ſhewn in the ſame manner.

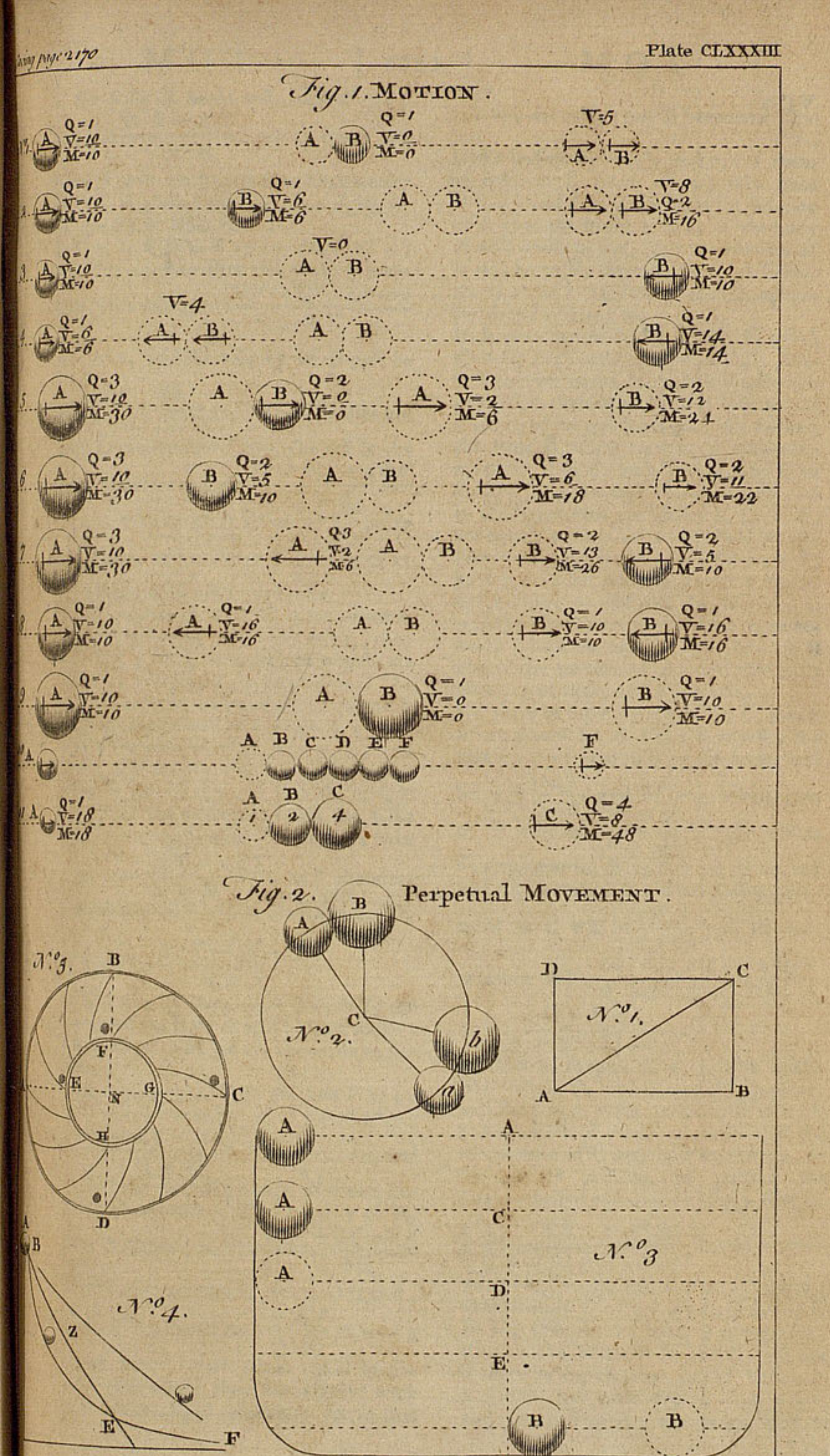
But ſince a part of this expreſſion (*viz.* $\frac{Q\mathcal{Q}}{Q+\mathcal{Q}}$) is conſtant, the loſs of motion will ever be proportional to the other part $\mathrm{V}\pm V$. But this loſs or change of motion in either body is the whole effect, and ſo meaſures the magnitude or energy of the ſtroke. Wherefore any two bodies, not elaſtic, ſtrike each other with a ſtroke always proportionable to the ſum of their velocities $(\mathrm{V}+V)$ if they meet, or to the difference of their velocities $(\mathrm{V}-V)$ if they tend the ſame way.

Hence, if one body (B) be at reſt before the ſtroke, then $V=0$; and the magnitude of the ſtroke will be as V; that is, as the velocity of the moving body A; and not as the ſquare of its velocity, as many philoſophers, (*viz.* the Dutch and Italians) maintain.

In bodies perfectly elaſtic, the reſtituent power or ſpring by which the parts diſplaced by the ſtroke reſtore themſelves to their firſt ſituation, is equal to the force impreſſed, becauſe it produces an equal effect; therefore, in this ſort of bodies, there is a power of action twice as great as in the former non-elaſtic bodies, for theſe bodies not only ſtrike each other by impulſe, but likewiſe by repulſe, they always repelling each other after the ſtroke. But we have ſhewn that the force with which non-elaſtic bodies ſtrike each other is as $\mathrm{V}\pm V$; therefore the re-action of elaſtic bodies is the ſame; that is, the velocity with which elaſtic bodies recede from each other after the ſtroke, is equal to the velocity with which they approached each other before the ſtroke. Whence if x and y be the velocities of two bodies A and B, tending the ſame way, after the ſtroke, ſince $\mathrm{V}-V=y-x$, we have $x+\mathrm{V}-V=y$; whence the motion of A after the ſtroke will be Qx, and that of B will be $\mathcal{Q}x+\mathcal{Q}\mathrm{V}-\mathcal{Q}V$; and the ſum of theſe motions will be equal to the ſum of the motions before the ſtroke, *viz.* $Qx+Qx+\mathcal{Q}\mathrm{V}-\mathcal{Q}V=Q\mathrm{V}+\mathcal{Q}V$. Whence, by reducing the equation, it will be $Qx+\mathcal{Q}x=Q\mathrm{V}-\mathcal{Q}\mathrm{V}+2\mathcal{Q}V$; and $x=\frac{Q\mathrm{V}-\mathcal{Q}\mathrm{V}+2\mathcal{Q}V}{Q+\mathcal{Q}}=$ the velocity of the body A.

Again, the velocity of B is $x+\mathrm{V}-V=\frac{Q\mathrm{V}-\mathcal{Q}\mathrm{V}+2\mathcal{Q}V}{Q+\mathcal{Q}}+\mathrm{V}-V=\frac{2Q\mathrm{V}-QV+\mathcal{Q}V}{Q+\mathcal{Q}}$. Here we ſuppoſe the bodies tend the ſame way before the ſtroke; and it is evident from the equation above, that ſo long as $Q\mathrm{V}+2\mathcal{Q}V$ is greater than $\mathcal{Q}\mathrm{V}$, the velocity (x) of A after the ſtroke will be affirmative, or the body A will move the ſame way after the ſtroke as before; but when $\mathcal{Q}\mathrm{V}$ is greater than $Q\mathrm{V}+2V\mathcal{Q}$, the velocity ($x$) will be negative, or the body A will be reflected back.

If


Fig. 1. Motion.
Q=1 V=10 M=10
Q=1 V=0 M=0
V=5
Q=1 V=6 M=6
V=8 Q=2 M=16
V=0
V=4
Q=3 V=10 M=30
Q=2 V=0 M=0
Q=3 V=2 M=6
Q=2 V=12 M=24
Q=2 V=5 M=10
Q=3 V=6 M=18
Q=2 V=11 M=22
Q=2 V=13 M=26
Q=2 V=5 M=10
Q=1 V=16 M=16
Q=1 V=18 M=18
Q=4 V=8 M=48
Fig. 2. Perpetual Movement.
No. 1.
No. 2.
No. 3
No. 4.
J. Jefferys sculp

If the body B be at rest, then $\mathcal{V}=0$; and $x=\frac{QV-\mathcal{Q}V}{Q+\mathcal{Q}}$, which shews the body A will go forwards or backwards, as QV is greater or lesser than $\mathcal{Q}V$, or A greater or lesser than B.

If $Q=3$, $\mathcal{Q}=2$, $V=10$, (*ibid.* n° 5.) and $\mathcal{V}=0$; then after the stroke the velocity of A will be $x=\frac{QV-\mathcal{Q}V}{Q+\mathcal{Q}}=\frac{30-20}{5}=\frac{10}{5}=2$, and the velocity of B will be $y=\frac{2QV}{Q+\mathcal{Q}}=\frac{60}{5}=12$. If the bodies are both in motion, and $\mathcal{V}=5$, the rest is the same as before; then $\frac{QV-\mathcal{Q}V+2\mathcal{Q}\mathcal{V}}{Q+\mathcal{Q}}=6=$ velocity of A (*ibid.* n° 6.) after the stroke, and $\frac{2QV-Q\mathcal{V}+\mathcal{Q}\mathcal{V}}{Q+\mathcal{Q}}=11$ = velocity of B after the stroke.

If the bodies A and B move towards contrary parts, or meet each other, then will the relative velocity, to which the force of the stroke is proportional, be $V+\mathcal{V}$; and so the velocities of A and B after the stroke will be x and $x+V+\mathcal{V}$; and so the motion of A will be Qx and $\mathcal{Q}x+\mathcal{Q}V+\mathcal{Q}\mathcal{V}$; the sum of these motions is $Qx+\mathcal{Q}x+\mathcal{Q}V+\mathcal{Q}\mathcal{V}=QV-\mathcal{Q}\mathcal{V}=$ the motion towards the same part before the stroke. Whence we have $x=\frac{QV-\mathcal{Q}V-2\mathcal{Q}\mathcal{V}}{Q+\mathcal{Q}}$, and therefore the velocity of B will be $\frac{QV-\mathcal{Q}V-2\mathcal{Q}\mathcal{V}}{Q+\mathcal{Q}}+V+\mathcal{V}=\frac{2QV+Q\mathcal{V}-\mathcal{Q}\mathcal{V}}{Q+\mathcal{Q}}$.

If $QV+2\mathcal{Q}\mathcal{V}$ be greater than QV, the motion of the body A will be backwards; otherwise it will go on forwards as before.

If $Q=3$, $\mathcal{Q}=2$, $V=10$, and $\mathcal{V}=5$; then will the velocity of A (*ibid.* n° 7.) be $\frac{QV-\mathcal{Q}V-2\mathcal{Q}\mathcal{V}}{Q+\mathcal{Q}}=\frac{-10}{5}=-2$, and so the body A will go back with two degrees of velocity. The velocity of B, after the stroke, will be $\frac{2QV+Q\mathcal{V}-\mathcal{Q}\mathcal{V}}{Q+\mathcal{Q}}=13$.

If the bodies are equal, that is, if $Q=\mathcal{Q}$, (*ibid.* n° 8.) then $x=\frac{-2\mathcal{Q}\mathcal{V}}{2\mathcal{Q}}=-\mathcal{V}$; which shews, that when equal bodies meet each other, they are reflected back with interchanged velocities; for in that case also the velocity of B becomes $\frac{2QV}{2\mathcal{Q}}=V$.

If the bodies are equal, and one of them at rest, as B (*ibid.* n° 9.) then since $Q=\mathcal{Q}$, and $\mathcal{V}=0$, we have the velocity of A after the stroke $x=0$; or the body A will abide at rest, and the velocity of B will be $=V$, the velocity of A before the impulse, as appears by the example in the figure referred to.

If several bodies B, C, D, E, F, (*ibid.* n° 10.) are contiguous in a right line, and another equal body A strike B with any given velocity, it shall lose all its motion, or be quiescent after the stroke; the body B which receives it will communicate it to C, and C to D, and D to E, and E to F; and because action and re action between the bodies B, C, D, E, are equal, as they were quiescent before, they must continue so; but the body F, having no other body to re-act upon it, has nothing to obstruct its motion; it will therefore move on with the same velocity which A had at first, because it has all the motion of A, and the same quantity of matter by hypothesis.

Let there be three bodies A, B, C, (*ibid.* n° 11.) and let A strike B at rest; the velocity generated in B by the stroke will be $y=\frac{2QV}{Q+\mathcal{Q}}$, and so the momentum of B will be $\frac{2QV\mathcal{Q}}{Q+\mathcal{Q}}=\mathcal{Q}y$. With this momentum B will strike C at rest and contiguous to it; the velocity generated in C will be $\frac{2\mathcal{Q}y}{\mathcal{Q}+C}$; and its momentum will be $\frac{2\mathcal{Q}yC}{\mathcal{Q}+C}=\frac{2\mathcal{Q}C}{\mathcal{Q}+C}\times\frac{2QV}{Q+\mathcal{Q}}=\frac{4QV\mathcal{Q}C}{Q\mathcal{Q}+QC+\mathcal{Q}^2+\mathcal{Q}C}$.

If now we suppose B a variable quantity, while A and C remain the same, we shall find what proportion it must have to each of them, in order that the momentum of C may be a maximum, or the greatest possible, by putting the fluxion thereof equal to nothing; that is, $\frac{4Q^2C^2V\dot{\mathcal{Q}}-4QC\mathcal{Q}^2\dot{\mathcal{Q}}}{(QC+Q\mathcal{Q}+\mathcal{Q}C+\mathcal{Q}^2)^2}=0$; whence we get $QC-\mathcal{Q}\mathcal{Q}=0$, and so $QC=\mathcal{Q}\mathcal{Q}$; consequently $Q:\mathcal{Q}::\mathcal{Q}:C$, or $A:B::B:C$; that is, the body B is a geometrical mean between A and C. Hence if there be any number (n) of bodies in a geometrical ratio (r) to each other, and the first be A; the second will be rA,

rA, the third r^2A, and so on to the laſt, which will be r^{n-1} A.

Alſo, the velocity of the firſt being V, that of the ſecond will be $\frac{2V}{1+r}$ (for $\frac{2QV}{Q+\mathfrak{Q}}$ is here $=\frac{2AV}{A+rA}=\frac{2V}{1+r}$) that of the third $\frac{4V}{\overline{1+r}^2}$, that of the fourth $\frac{8V}{\overline{1+r}^3}$, and ſo on to the laſt, which will be $\overline{\frac{2}{1+r}}\Big|^{n-1}$ V.

The momentum of the firſt will be AV, that of the ſecond $\frac{2rAV}{1+r}$, that of the third $\frac{4r^2AV}{\overline{1+r}^2}$, that of the fourth $\frac{8r^3AV}{\overline{1+r}^3}$, and ſo on to the laſt, which will be $\overline{\frac{2r}{1+r}}\Big)^{n-1}$ AV.

To give an example of this theorem; if $n=100$, and $r=2$, then will the firſt body A be to the laſt r^{n-1} A, as 1 to 633825300000000000000000000000, nearly; and its velocity to that of the laſt nearly as 271022000000000000 to 1: laſtly, the momentum of the firſt to that of the laſt will be nearly as 1 to 2338480000000. If the number (n) of bodies be required, and the ratio of the momenta of the firſt and laſt be given as 1 to M, and the ratio of the ſeries r given alſo; then, putting $\frac{2r}{1+r}=$ R, we have the momentum of the laſt body expreſſed by $\overline{\frac{2r}{1+r}}\Big)^{n-1}=\text{M}=\text{R}^{n-1}$; therefore the logarithm of M (l. M) is equal to the logarithm of R (l. R) multiplied by the power $n-1$; that is, $l.\text{M}=\overline{n-1}\times l.\text{R}$; conſequently $\frac{l.\text{M}}{l.\text{R}}+1=n$, the number of bodies required.

Perpetual MOTION, or MOVEMENT. See the article MOVEMENT.

Animal MOTION, is that whereby the ſituation, figure, magnitude, *&c.* of the parts, *&c.* of animals are changed: under theſe are comprized all the animal functions. See the article FUNCTION.

Animal motions are divided into ſpontaneous and natural.

Spontaneous or *muſcular* MOTION, is that performed by the muſcles at the command of the will. See MUSCLE.

Natural or *involuntary* MOTION, that effected, without any ſuch command, by the mere mechaniſm of the parts, ſuch as the motion of the heart, pulſe, *&c.*

Inteſtine MOTION, the agitation of the particles of which a body conſiſts.

Some philoſophers will have every body and every particle thereof in continual motion. Hence inteſtine motion is repreſented to be a motion of the internal and ſmaller parts of matter, continually excited by ſome external latent agent, which only diſcovers itſelf by its effects, being appointed by nature as the great inſtrument of the changes in bodies.

MOTION, in aſtronomy, peculiarly denotes the orderly courſes of the heavenly bodies.

The motions of the celeſtial luminaries are diurnal or common, and ſecondary or proper.

Diurnal or *primary* MOTION, is that wherein the whole mundane ſphere appears to revolve every day round the earth from eaſt to weſt. See the article DIURNAL.

This is called the motion of the primum mobile, and the common motion, to diſtinguiſh it from that peculiar to each planet, *&c.*

Secondary or *proper* MOTION, is that wherewith a ſtar, planet, *&c.* advances a certain ſpace every day from weſt towards eaſt. See the article EARTH, *&c.*

MOTION, in muſic, the manner of beating the meaſure, to haſten or ſlacken the time of the words or notes. See TIME.

MOTIONS, in war, the marches, countermarches, *&c.* of an army in changing its poſt.

MOTIR, one of the Molucca-iſlands, ſubject to the Dutch: eaſt long. 125°, north lat. 30′.

MOTOLA, a town of the kingdom of Naples, fifteen miles north-weſt of Taranto.

MOTORY NERVES, in anatomy, the third pair, joining to the eyes. See the article NERVES.

MOTOS, a term uſed by Galen for the fineſt kind of Caſſia. See CASSIA.

The term motos likewiſe denotes lint to put into wounds, *&c.*

MOTRIL, a town of Spain, in the province of Granada, ſituated on the Mediterranean, forty miles ſouth of the city of Granada.

MOTTO, in armoury, a ſhort ſentence or phraſe carried in a ſcroll, generally under, but ſometimes over the arms; ſometimes alluding to the bearing, ſometimes to the name of the bearer, and ſometimes containing whatever pleaſes the fancy of the deviſer. The motto, or word, ſays Guillim, is an ornament annexed to coat-armour; being the invention or conceit of the bearer ſuccinctly and ſignificantly expreſſed, uſually in three or four words, which are commonly ſet in ſome ſcroll or compartment, placed at the foot of the eſcutcheon. Our anceſtors made choice of ſuch mottos as expreſſed their predominant paſſions, as of piety, love, war, *&c.* or ſome extraordinary adventure that had befallen them: moſt of which have become hereditary in ſeveral families. The motto of the royal family of England is DIEU ET MON DROIT, *God and my right*: of the preſent king of France, ESPERANCE, *hope*: of the moſt noble order of the garter, HONI SOIT QUI MAL Y PENSE, *evil be to him that evil thinks*: of the dukes of Norfolk, SOLA VIRTUS INVICTA, *only virtue is invincible*; of the duke of Beaufort, MUTARE VEL TIMERE SPERNO, *I ſcorn to change or fear*: of the duke of Kingſton, PIE REPONE TE, *reſt in piety*, in alluſion to his name of Pierpoint.

MOTU. See EX MERO MOTU.

MOVEABLE, in general, denotes any thing capable of being moved.

The moveable feaſts are ſuch as are not regularly held on the ſame day of the year or month, though they are always on the ſame day of the week. Thus Eaſter, which is that moveable feaſt on which all the reſt depend, is held on the Sunday which falls upon, or next after, the firſt full moon following the 21ſt of March; and all the other feaſts keep a regular and certain diſtance from it; ſuch as Septuageſima, Sexageſima, Aſhwedneſday, Aſcenſion-day, *&c.* which ſee under their proper articles.

The moveable terms are Eaſter term, and Trinity term. See TERMS.

MOVEABLE GOODS, in law, ſuch chattels as are capable of being removed from one place to another, as cattle, merchandize, *&c.* See the article CHATTELS.

MOVEMENT, in mechanics, a machine that is moved by clock-work; for the theory of which, ſee the articles CLOCK, WATCH, *&c.*

To make a regular movement, that may ſerve to meaſure time as exactly as poſſible, is one of the moſt valuable problems in mechanics, which has been moſt ſucceſsfully effected, hitherto, by adapting pendulums to clocks: though it muſt be owned, ſays Mr. Maclaurin, that many ingenious contrivances have been invented to correct the irregularities of thoſe movements that go by ſprings.

Perpetual MOVEMENT. Some have attempted to find a perpetual movement, but without ſucceſs; and there is reaſon to think, from the principles of mechanics, that ſuch a movement is impoſſible: for though in many caſes of bodies acting upon one another, there is a gain of abſolute motion; yet the gain is always equal in oppoſite directions, ſo that the quantity of direct motion is never increaſed.

To make a perpetual movement it appears neceſſary, that a certain ſyſtem of bodies, of a determined number and quantity, ſhould move in a certain ſpace for ever, and in a certain way and manner: and for this there muſt be a ſeries of actions returning in a circle, otherwiſe the movement will not be perpetual; ſo that any action by which the abſolute quantity of force is increaſed, of which there are ſeveral ſorts, muſt have its correſponding counter-action, by which the gain of force is deſtroyed, and the quantity of force reſtored to its firſt ſtate. See the article FORCE.

Thus, by theſe actions, there will never be any gain of direct force, to overcome the friction and the reſiſtance of the medium; ſo that every motion being diminiſhed by theſe reſiſtances, they muſt at length languiſh and ceaſe.

To illuſtrate this, it is allowed, that, by the reſolution of force, there is a gain or increaſe of the abſolute quantity of force: thus, the two forces $AB + BC$ (plate CLXXXIII. fig. 2. n° 1.) exceed the force AC, which is reſolved into them. But you cannot proceed reſolving motion in infinitum, by any machine whatſoever; but thoſe you have reſolved muſt be again compounded, in order to make a continual movement; and the gain, obtained by the reſolution, will be loſt again by the compoſition.

In like manner, if you ſuppoſe A and B (*ibid.* n° 2.) to be perfectly elaſtic bodies, and that the leſſer body A ſtrikes the greater one B quieſcent, there will be an increaſe of the abſolute quantity of force, becauſe A will be reflected; but if you ſuppoſe them both to turn round any center C, after the ſtroke, ſo as to meet again

again in *a* and *b*, this increafe of force will be loft, and their motion reduced to its firft quantity. Such a gain therefore of force, as muft be afterwards loft in the actions of bodies, can never produce a perpetual movement.

There are various ways befides thefe, by which abfolute force may be gained; but fince there is always an equal gain in oppofite directions, and no increafe obtained in the fame direction, this gain muft be prefently loft in the circle of actions neceffary to make a perpetual movement.

Some authors propofe to make a perpetual movement upon thefe principles: let the height A B *(ibid.* n° 3.) be divided into four equal parts A C, C D, D E, E B: then fuppofe the body A to acquire, by the defcent A B, a velocity as 1, and this motion by any contrivance to be tranfmitted to an equal body B; then let the body A, by an equal defcent C D, acquire another motion as 1, to be tranfmitted likewife to the fame body B, which in this manner is fuppofed to acquire a motion as 2, that is fufficient to carry it upwards from B to A; and becaufe there yet remains the motion which A acquires by the defcents D E and E B, that may be fufficient to keep an engine in motion, while B and A afcend and defcend by turns. Thus, they rafhly conclude, that a fufficient gain of force may be obtained in this manner, to produce a perpetual movement; for it is demonftrable from the principles of motion, that a motion as 2 cannot be produced in B by the two fucceffive impulfes tranfmitted from A, each of which is as 1.

Others have propofed projects for producing a perpetual movement, with a defign to refute them; but by miftaking the proper anfwer, have rather confirmed the unfkilful in their groundlefs expectations. An inftance of this we have in Dr. Wilkin's mathematical magic, B. II. c. 13. where a loadftone at A *(ibid.* n° 4.) is fuppofed to have a fufficient force to bring up a heavy body along the plane F A, from F to B; whence the body is fuppofed to defcend by its gravity, along the curve B E F till it return to its firft place F; and then to rife again along the plane F A, and defcend along the curve B E F, continually. But fuppofing B Z E to be the furface upon which if a body was placed, the attraction of the loadftone and the gravity of the body would balance each other; this furface muft meet B E F at fome point E, between A and F; fo that when it comes to the point E, it muft of courfe be ftopped, and an end put to the motion.

What feems to promife the poffibility of fuch a movement, is this, *viz.* that the momenta of equal bodies are as their diftances from the center of motion. Hence, fay the perpetual motion men, if a wheel were conftructed of the form of that in the figure A B C D *(ibid.* n° 5.) with circular cells going from the inner part E F G H to the outer, containing equal balls, C, D, E, F; then upon turning the wheel they muft move towards the center N on one part, as the ball E; and from it on the oppofite part, as the ball C; and by this means the ball C will have a greater momentum than the ball F, and fo will determine the wheel to move round; and fince this muft be the cafe of all the balls E and C that come into the fituation E C, the wheel muft neceffarily move continually, becaufe it will bring two balls into that fituation. It is true, were there but two balls E and C, the ball C would by this contrivance move the wheel ¼ round, *viz.* while it defcended from C to D; and by this means would raife the ball E to F, and there they will abide in the fituation D F; but, fay the men of this perfuafion, two other balls, fucceeded to the places E and C, will ftill keep the wheel moving. Yes, fo they would, if the balls at D and E could be taken away the moment they come into that pofition; not elfe, for the balls C and E, in order to move the wheel, muft move the balls D and F, which have equal momenta (as being at the fame diftance each from the center, as are the other two refpectively) which is abfurd by the general propofition.

The abfurdity of a perpetual motion will ftill farther appear, if we confider that the momenta of bodies are always proportioned to the perpendicular defcent or afcent to or from the center of the earth. Since, therefore, in the wheel the bodies are all equal by fuppofition, and the perpendicular fpaces through which they defcend and afcend, above and below the horizontal line or diameter A C, are equal; it follows, that an equilibrium muft neceffarily enfue. Thus, fo far is this wheel from producing a perpetual motion, that it admits of none at all.

MOULD, or MOLD, in the mechanic arts, &c.

&c. a cavity cut with a defign to give its form or impreffion to fome fofter matter applied therein, of great ufe in fculpture, foundery, &c.

The workmen employed in melting the mineral or metallic glebe dug out of mines, have each their feveral moulds to receive the melted metal as it comes out of the furnace; but thefe are different according to the diverfity of metals and works. In gold-mines they have moulds for ingots; in filver-mines, for bars; in copper and lead mines, for pigs or falmons; in tin-mines, for pigs and ingots; and in iron-mines, for faws, chimney-backs, anvils, caldrons, pots, and other large utenfils and merchandizes of iron, which are here caft as it were at firft hand.

The MOULDS *of founders*, for large works, as ftatues, bells, guns, as alfo thofe for fmall works, may be feen under the article FOUNDERY.

The MOULDS *of moneyers*, are frames full of fand wherein the plates of metal are caft that are to ferve for the ftriking of fpecies of gold and filver. See the article COINING.

MOULDS, in the manufacture of paper, are little frames compofed of feveral brafs or iron-wires, faftened together by another wire ftill finer. Each mould is of the bignefs of the fheet of paper to be made, and has a rim or ledge of wood to which the wires are faftened; thefe moulds are more ufually called frames, or forms.

Furnace and crucible-makers MOULDS, are made of wood, of the fame form with the crucibles; that is, in form of a truncated cone: they have handles of wood to hold and turn them with, when, being covered with the earth, the workman has a mind to round or flatten his veffel.

MOULDS *for leaden bullets*, are little iron-pincers, each of whofe branches terminates in an hemifpherical concavity, which when fhut, form an intire fphere: in the lips or fides where the branches meet, is a little jet or hole through which the melted lead is conveyed.

Glaziers-MOULDS. The glaziers have two kinds of moulds, both ferving to caft their lead. In the one they caft the lead into long rods or canes fit to be drawn through the vice, and the grooves formed therein: this they fometimes call ingot mould. In the other they mould thofe little pieces of lead a line thick, and two lines broad, faftened to the iron-bars: thefe may be alfo caft in the vice.

Goldfmiths-MOULDS. The goldfmiths ufe the bones of the cuttle-fifh to make moulds for their fmall works, which they do by preffing the pattern between two bones, and leaving a jet or hole to convey the filver through, after the pattern has been taken out.

MOULD, among mafons, a piece of hard wood or iron hollowed withinfide, anfwerable to the contours of the mouldings or corniches, &c. to be framed: this is otherwife called caliber.

MOULDS, among plumbers, are the tables whereon they caft the fheets of lead. Thefe they fometimes call fimple tables: befides which they have other real moulds wherewith they caft pipes without foldering. See the article PLUMBERY.

MOULDS, among grinders of optic-glaffes. See the article GRINDING.

MOULDS, ufed in bafket-making are very fimple, confifting ordinarily of a willow, or ofier, turned or bent into an oval, circle, fquare, or other figure, according to the bafkets, panniers, hampers, hats, and other utenfils intended. On thefe moulds they make or more properly meafure all their work, and accordingly they have them of all fizes, fhapes, &c.

MOULDS, among tallow-chandlers, are of two kinds: the firft for the common dipped candles, being the veffel wherein the melted tallow is difpofed, and the wick dipped: this is of wood, of a triangular form, and fupported on one of its angles, fo that it has an opening of near a foot at top: the other, ufed in the fabric of mould candles, is of brafs, pewter, or tin; here each candle has its feveral moulds. See the article CANDLE.

MOULD, among gold-beaters, a certain number of leaves of velom, or pieces of guts, cut fquare, of a certain fize, and laid over one another, between which they put the leaves of gold and filver, which they beat on the marble with the hammer. They have four kinds of moulds, two whereof are of velom, and two of gut; the fmalleft of thofe of velom confifts of forty or fifty leaves, the largeft contains an hundred: for the others, each contains five hundred leaves. The moulds have all their feveral cafes, confifting of two pieces of parchment, ferving to keep the leaves of the mould in their place, and prevent their being difordered in beating.

MOULD, in agriculture, a loofe kind of earth, every where obvious on the fur-

face of the ground, called alfo natural or mother-earth; by fome alfo loam. See the article EARTH.

The goodnefs of a mould for the purpofes of gardening, &c. may be known, according to Miller, by the fight, fmell, and touch. 1. Thofe moulds that are of a bright chefnut or hazelly colour, are counted the beft: of this colour are the beft loams, and alfo the beft natural earth; and this will be the better yet, if it cut like butter, and does not ftick obftinately, but is fhort, tolerably light, breaking into fmall clods, is fweet, will be tempered without crufting or chopping in dry weather, or turning to mortar in wet. Next to that the dark grey and ruffet moulds are accounted the beft: but the light and dark afh-coloured the worft, fuch as is ufually found on common heathy ground: the clear tawney is by no means to be approved; but that of a yellowifh red colour is the worft of all: this is commonly found in wild and wafte parts of the country, and for the moft part produces nothing but gofs, furze, and fern, according as their bottoms are more or lefs of a light and fandy, or of a fpewey, gravel, or clayey nature. 2. All lands that are good and wholefome, will, after rain, or breaking up by the fpade, emit a good fmell. 3. By the touch we may difcover whether it confifts of fubftances entirely arenaceous, or clammy; or, as it is expreffed by Mr. Evelyn, whether it be tender, fatty, deterfive, or flippery; or more harfh, gritty, porous, or friable.

MOULDINESS, a term applied to bodies which corrupt in the air, from fome hidden principle of humidity therein; and whofe corruption fhews itfelf by a certain white down, or lanugo, on their furface, which, viewed through a microfcope, appears like a kind of meadow, out of which arife herbs and flowers, fome only in the bud, others full blown, and others decayed, each having its root, ftalk, and other parts. See the articles CORRUPTION and VEGETATION.

MOULDING, any thing caft in a mould, or that feems to have been fo, though in reality it were cut with a chiffel, or the ax.

Moulding of figures in pafte is done as follows: take the crumb of a new drawn white loaf, beat it, and roll it with a rolling-pin as fine and as far as it will go; then print it on the moulds: and when it has taken the fuitable figure you defire, dry it in a ftove, and it will be very hard: and to preferve it from vermin, you may mix a little powder of aloes with it.

To mould fmall figures of jafper-colour: oil your moulds with a fine pencil, and diverfify them with fuch colours as you pleafe, with gum-tragacanth; if they fpread or run, put a little of the gall of an ox, for the thicker it is, the harder it will be: then mould your pafte of the colour of jafper, or the like; put it in to fill the mould; tie it with a wire, and take it out; repair and varnifh it, and fet it to harden.

MOULDINGS, in architecture, projectures beyond the naked wall, column, wainfcot, &c. the affemblage of which forms corniches, door-cafes, and other decorations of architecture. See pl. CLXXXI. fig. 4.

Some mouldings are fquare, others round, fome are ftraight, others curved, &c. and fome are plain, others carved, or adorned with fculpture, either hollowed or in relievo: fome again are crowned with a fillet, others are without, as the doucine, talon, ovolo, torus, fcotia, aftragal, gula, corona, &c. See the articles DOUCINE, &c.

Mouldings are in architecture, what letters are in writing; by the various difpofitions and combinations of mouldings may be made an infinite number of different profiles, for all forts of orders and compofitions, regular or irregular; and yet all the kinds of mouldings may be reduced to three, *viz.* fquare, round, and mixed, *i. e.* compofed of the other two. For this reafon, thofe who invented the gothic architecture, refolving to recede from thofe perfect figures, and affecting to ufe others lefs perfect, to diftinguifh their architecture from the antique, introduced a new fet of whimfical mouldings and ornaments. Regular mouldings are either large, as doucines, ovolos, gulas, talons, fcotias, &c. or fmall, as fillets, aftragals, conges, &c.

MOULIN, or *Fer de* MOULIN. See the article FER.

MOULINS, a city of France, in the province of Lionois, and dutchy of Bourbon, fituated forty-feven miles fouth-eaft of Bourges.

MOULINET, is ufed, in mechanics, to fignify a roller, which being croffed with two levers, is ufually applied to cranes, capftans, and other forts of engines of the like nature, to draw ropes, and heave up ftones, &c.

MOULINET is alfo a kind of turnftile, or wooden crofs, which turns horizontally upon

upon a ſtake fixed in the ground; uſually placed in paſſages to keep out horſes, and to oblige paſſengers to go and come one by one. Theſe moulinets are often ſet near the outworks of fortified places at the ſides of the barriers, through which people paſs on foot.

MOULTING, or MEWING. See the article MEWING.

MOUND, a term uſed for a bank or rampart, or other fence, particularly that of earth.

MOUND, in heraldry, a ball or globe with a croſs upon it, ſuch as our kings are uſually drawn with, holding it in their left hands, as they do the ſceptre in the right.

MOUNT, an elevation of earth, called alſo mountain. See MOUNTAIN.

Saint Catharine of MOUNT *Sinai*. See the article CATHARINE.

Knights of MOUNT *Carmel*. See the article CARMELITES.

MOUNT-CASSEL, a town of the french Netherlands, in the province of Flanders, ſituated fifteen miles ſouth-weſt of Ypres.

MOUNT ST. MICHAEL, a borough-town of Cornwal, ſituated on a bay of the Engliſh channel, called Mountſbay, eighteen miles weſt of Falmouth.

It ſends two members to parliament.

MOUNT ST. MICHAEL is alſo a fortreſs of France, in the province of Normandy, ſituated on a rock in the Engliſh channel, twenty miles eaſt of St. Malo.

MOUNT-SORREL, a market-town of Leiceſterſhire, ſeven miles north of Leiceſter.

MOUNT-EGG. In the tin-works, after the tin from the burnt ore is melted down and remelted, there will ſometimes remain a different ſlug in the bottom of the float; this they call mount-egg: and though of a tin-colour, yet is of an iron-nature, as has been found by applying a magnet to it.

MOUNT *of Piety*, certain funds or eſtabliſhments in Italy, where money is lent out, on ſome ſmall ſecurity. We had alſo mounts of piety in England, raiſed by contribution, for the benefit of people ruined by the extortions of the Jews.

MOUNTAIN, *mons*, a part of the earth, riſing to a conſiderable height above the level of the ſurface thereof.

The origin of mountains is variouſly aſſigned by pholoſophers: ſome will have them coeval with the world, and created along with it; others, among whom is Dr. Burnet, will have them to take their riſe from the deluge, urging that the extreme irregularity and diſorder viſible in them, plainly ſhews they do not come immediately out of the hand of God, but are the wrecks of the old world, broken into the abyſs. See DELUGE.

Others, again, alledge from hiſtory, that the roots of many hills being eaten away, the hills themſelves have ſubſided and ſunk into plains; whence they conclude, that where the corruption is natural, the generation is ſo too. It appears certain to many, that ſome mountains muſt have been generated gradually, and have grown up in proceſs of time, from the ſea-ſhells, &c. found in them, which they ſuppoſe may be accounted for, from a violent wind blowing the ſand, &c. into huge heaps, which were made into a maſs by the rain, &c. The origin of mountains in the opinion of Mr. Ray, ſeems to have been from exploſions, by means of ſubterraneous fires; and he thinks it very probable, that they all have vaſt hollows beneath them; and that this might have been the means uſed at the creation, to make the dry land appear, he thinks no way diſſonant to reaſon, ſince hiſtory proves that fires have raged in ſubterraneous caverns under the ſeas; and there is no natural impoſſibility in fire's ſubſiſting in ſuch caverns, even when the earth was all over covered with water, as at the firſt creation.

Mountains appear to many, defects and blemiſhes in the earth; but they are truly of the utmoſt uſe and neceſſity to the well-being both of man and other animals. They ſerve as ſcreens to keep off the cold and nipping blaſts of the northern and eaſtern winds; they ſerve for the production of a great number of vegetables and minerals, which are not found in any other ſoil; the long ridges and chains of lofty and topping mountains being generally found to run from eaſt to weſt, ſerve to ſtop the evagation of the vapours towards the poles, without which they would all run from the hot countries, and leave them deſtitute of rain. Mr. Ray adds, that they condenſe theſe vapours, like alembic heads, into clouds, and ſo, by a kind of external diſtillation, give origin to ſprings and rivers; and, by amaſſing, cooling, and conſtipating them, turn them into rain, and by that means render the fervid region of the torrid zone habitable. He farther adds, that many creatures cannot live but in particular ſituations, and even the tops of the higheſt and

and the coldeft mountains are the only places where fome creatures, as well birds as quadrupeds, will live; of this kind are the ibex and chamois among beafts, and the lagopus among birds. See the articles IBEX, &c.

To meafure the height of a mountain, the fame method muft be ufed as is done in meafuring any other inacceffible height. See the article HEIGHT.

There is another method propofed for taking the height of a mountain, by means of the barometer: thus, it is to be obferved, how many inches or parts of inches, the quickfilver is depreffed, at the top of the mountain we have a mind to meafure, below the altitude it hath acquired, at the fame time, at the bottom or fuperficies of the fea; for hence the true height of the mountain may be found, from an eftablifhed proportion. In order to difcover the height of a mountain, or that of any other thing, Dr. Halley, from barometrical obfervations, on Snowden-hill, concludes that the quickfilver defcends a tenth of an inch every thirty yards of afcent: and Dr. Derham, by good obfervations on the Monument of London, reckons eighty two feet for every tenth of an inch; but, by very nice obfervations which he afterwards made with excellent inftruments, at divers altitudes, in St. Paul's dome, and when the barometer was at a different height, he found, at near ninety feet, the quickfilver funk one tenth, and at fomewhat lefs than double and treble that height, two tenths, and three tenths, &c. according to Dr. Halley's and Mr. Caffini's tables. See the article BAROMETER.

To meafure the height of a lunar mountain is a curious problem, and, at the fame time, very eafy to effect in the following manner. Let C (plate CLXXXII. fig. 8.) be the moon's center, E D B a ray of the fun touching the moon's furface in D, and the top of a mountain in B. Draw C B and C D; the height of the mountain A B is to be found. With a micrometer in a telefcope, find what proportion the diftance of the top of the mountain B, from the circle of illumination at D, bears to the diameter of the moon, that is, the proportion of the line D B to D F; and becaufe D F is known in miles, D B will be alfo known in that meafure.

Now admit that $DB : DC :: 1 : 8$, as in one of the hills it will be; then $\overline{DC}^2 + \overline{DB}^2 = 64 + 1 = 65 = \overline{CB}^2$; whence $\sqrt{65} = 8.062 = BC$; wherefore $BC - AC = 8.062 - 8 = 0.062 = AB$, the height of the mountain required. Wherefore, $AC : AB :: 8 : 0.062 :: 8000 : 62$. And, fince the moon's femidiameter $AC = 1096$ miles, therefore $8000 : 62 :: 1096 : 8.5$ nearly. This mountain then, being $8\frac{1}{2}$ miles high, is near three times higher than the higheft mountain on the earth.

Burning MOUNTAIN. See VULCANO.

Cat of the MOUNTAIN, in zoology. See the article CAT.

Cock of the MOUNTAIN, in zoology. See the article UROGALLUS.

MOUNTING, in the mechanic arts, fomething that ferves to raife or fet off a work: thus, the frame and its dependences make the mounting of a looking-glafs; the hilt, the mounting of a fword; the fuft, or but, the mounting of a carbine, mufquet, &c. and the mounting of a fan, is the fticks which ferve to open and fhut it.

MOUNTING, in military affairs, fignifies going upon duty: thus, mounting a breach, is running up to it; mounting the guard, is going upon guard; and mounting the trenches, is going upon duty in the trenches; but mounting a cannon, mortar, &c. is the fetting it on its carriage, or the raifing its mouth.

MOUREMANSKOY, the north-weft part of ruffian Lapland, in Europe.

MOURNERS, an order of penitents in the antient chriftian church, who lay proftrate in the porches of churches, begging the prayers of the faithful, as they went in, and defiring to do public penance in the church. See the article PENITENTS.

MOURNING, among the antients, was expreffed by very different figns, as by tearing their cloaths, wearing fackcloath, laying afide crowns and the other enfigns of honour: thus Plutarch, in his Life of Cato, relates, that from the time of his leaving the city with Pompey, he neither fhaved his head, nor, as ufual, wore the crown, or garland. A public grief was fometimes teftified by a general faft. Among the Romans, a year of mourning was ordained, by law, for women who had loft their hufbands. In public mournings, the fhops of Rome were fhut up; the fenators laid afide their laticlavian robes; the confuls fat in a lower feat than ufual; and the women laid afide all their ornaments. The antients had a remarkable way of mourning

ing for soldiers slain in battle; the whole army attended the funeral solemnities, with their arms and shields turned upside down. See the article FUNERAL.

The mournings of the eastern nations of Indians are much more closely followed, though of much shorter duration than ours. After the death of a near relation, they mourn fifteen days, during which time they eat nothing but rice and water: they are not to chew betle, or to use the common washings; but are to perform acts of charity, such as distributing food to the poor; and prayers are said, intreating the almighty to forgive the sins of the deceased, and to assign him a good place in the other world. On the sixteenth day, when the mourning is ended, they make a solemn feast, according to their abilities, and invite to it all their friends and neighbours. After this they annually, on the same day, give food to the poor, and renew their prayers for the happiness of the dead person.

The colours of the dress or habit worn to signify grief, are different in different countries. In Europe, the ordinary colour for mourning is black; in China, it is white, a colour that was the mourning of the antient spartan and roman ladies; in Turky, it is blue, or violet; in Egypt, yellow; in Ethiopia, brown; and kings and cardinals mourn in purple. Every nation and country give a reason for their wearing the particular colour of their mourning: black, which is the privation of light, is supposed to denote the privation of life; white is an emblem of purity; yellow is to represent, that death is the end of all human hopes, because this is the colour of leaves when they fall, and flowers when they fade; brown denotes the earth, to which the dead return; blue is an emblem of the happiness which it is hoped the deceased enjoys; and purple, or violet, is supposed to express a mixture of sorrow and hope.

MOUSE, in zoology, a species of mus, with a long and almost naked tail, and a white belly. See the article MUS.

It is common every where in houses and fields.

MOUSE-EAR, *myosotis*, in botany. See the article MYOSOTIS.

MOUSE-TAIL, *myosurus*. See the article MYOSURUS.

Dor-MOUSE, *sorex*. See SOREX.

Sea MOUSE, *aphrodita*. See the article APHRODITA.

MOUSEL, or MOSUL, a city of asiatic Turky, in the province of Diarbec, or Mesopotamia, situated on the river Tigris, opposite the place where Nineveh stood: east long. 43°, and north lat. 36°.

MOUTH, in anatomy, a part of the face, consisting of the lips, the gums, the insides of the cheeks, the palate, the salival glands, the os hyoides, the uvula, and the tonsils, which see under their proper articles.

Mr. Derham observes, that the mouth in the several species of animals, is nicely adapted to the uses of such a part, and well sized and shaped for the formation of speech, the gathering and receiving of food, the catching of prey, *&c.* In some creatures it is wide and large, in others little and narrow; in some it is formed with a deep incisure into the head, for the better catching and holding of prey, and more easy comminution of hard, large, and troublesome food; and in others with a shorter incisure, for the gathering and holding of herbaceous food. In birds, it is neatly shaped for piercing the air; hard and horny, to supply the want of teeth; hooked, in the rapacious kind, to catch and hold their prey; long and slender in those that have their food to grope for in moorish places; and broad and long, in those that search for it in the mud. Nor is the mouth less remarkable in insects: in some it is forcipated, to catch, hold, and tear the prey; in others aculeated, to pierce and wound animals and suck their blood; in others, strongly rigid, with jaws and teeth, to gnaw and scrape out their food, carry burdens, perforate the earth, nay the hardest wood, and even stones themselves, for houses and nests for their young.

MOUTH *of a horse*, in the manege, should be moderately well cloven; for when it is too large, it is difficult to bit a horse, so as that he may not swallow it, as the horsemen term it; and if he has a small mouth, it will be difficult to get the bit rightly lodged in it.

A horse is said to have a fine, sensible, tender, light, or loyal mouth, when he is so sensible in that part where the bit is placed, as to obey the least motion of the bridle; so a false mouth is a mouth that is not at all sensible, though the parts look well, and are well formed; and a mouth is said to be fixed and certain, when a horse does not check or beat upon the hand. See the article HAND.

MOUTH is used in the courts of princes, for what relates to their eating and drink-

ing: hence officers of the mouth, yeomen of the mouth.

Opening and ſhutting the MOUTH *of a cardinal.* See the article CARDINAL.

MOUTON D'ORE, an antient french gold-coin, worth about twelve ſols ſix deniers: it was firſt ſtruck in the reign of St. Louis, and probably took its name from the figure of a lamb repreſented on one of its ſides.

MOXA, a ſort of cotton or downy ſubſtance ſeparated from the leaves of a ſort of indian mug-wort; uſed by the eaſtern nations for cauterizing in certain parts of the body. See the articles CAUSTICS, CAUTERIZATION, and CAUTERY.

The firſt cauſtic of this kind we find uſed, was by Hippocrates and the other antient phyſicians, to cauterize parts in pain. Some of the moderns wonderfully extol cauterization with moxa, as the moſt effectual means to cure, and wholly extirpate the gout: but for the art of cauterizing with it, Heiſter thinks it neceſſary to obſerve the following particulars, *viz.* in the firſt place, to make a ſmall cone of the moxa, about a thumb's breadth long, made after the ſame manner as thoſe commonly uſed for a ſuffitus; the baſis of this cone is to be ſtuck upon the part with gum arabic, or gum tragacanth, and its point is then to be fired by a candle, or burning coal; by which means not only the cone will be gradually conſumed, but the painful part will be at laſt cauterized, and thence the pain of the gout will frequently have ſome remiſſion; but if the pains do not entirely vaniſh at the firſt, a new cone is to be applied again to the part, and the cauterization thus continued till the pain ceaſes; but however this proceſs may have been cried up by many of the Europeans, it is at preſent quite in diſuſe, on account, that beſides the acute pain it cauſes, it is frequently found to have little or no effect.

MOYNEAU, or MOINEAU, in fortification. See the article MOINEAU.

MSCYSLAW, the capital of the palatinate of Mſcyſlaw, in Poland, ſituated on the frontiers of Muſcovy: eaſt long. 31° 30′, and north lat. 54° 34′.

MUCILAGE, in pharmacy, is in general any viſcid and glutinous liquor.

For the preparation of the mucilage of tragacanth, we muſt have four veſſels, either of delf-ware, or common earth, varniſhed. Into one of theſe put a dram and a half of white gum tragacanth, bruiſed; into another put half an ounce of the ſeeds of pſyllium; into another, three drams of quince-ſeeds; and in the fourth ſix drams of the root of marſhmallows, well cleanſed, cut into ſmall portions and bruiſed: upon the gum tragacanth pour two ounces and a half of ſtrawberry-water, and as much of betony-water; then cover the veſſel, and place it over hot aſhes, for three or four hours, or till the gum is entirely melted and incorporated with the water; then the matter is to be paſſed through a proper ſearce.

In preparing the mucilage of flea-wort, or pſyllium, pour three ounces of ſtrawberry-water, and as much of betony-water, on the ſeeds of pſyllium; then cover the veſſel, and let the matter ſtand in infuſion over warm aſhes, for eight or ten hours: after which, boil the infuſion gently, and ſtrain it by expreſſion.

In making a mucilage of quinces, on the quince-ſeeds pour two ounces and a half of betony-water, and as much of the water of ſtrawberries: cover the veſſels, and leave the matter in fuſion, for eight or ten hours; after which heat the infuſion till it is almoſt ready to boil; then it is to be ſtrained by expreſſion.

MUCILAGE alſo denotes a thick pituitous matter, evacuated with the urine, in the gravel and dyſuria. See the articles STONE and DYSURY.

MUCILAGE alſo imports the liquor which principally ſerves to moiſten the ligaments and cartilages of the articulations; and is ſupplied by the mucilaginous glands. See the next article.

MUCILAGINOUS GLANDS, in anatomy, a very numerous ſet of glands, ſerving to ſecrete the mucilage of the joints. See GLAND, and the preceding article.

Theſe glands are commonly ſituated in the joint after ſuch a manner as to be gently preſſed, but not deſtroyed by its motion; by which means, when there is the greateſt neceſſity for the mucilage, that is, when the moſt frequent motions are performed, the greateſt quantity of it muſt be ſecreted. Theſe glands are ſoft and pappy, but not friable; they are moſtly of the conglomerate kind: their excretory ducts are long, and hang looſe like ſo many fringes, within the articulation, which, by its motion and preſſure, will prevent obſtructions in the body of the gland itſelf, or its excretories, and will promote the return of the mucilage,

when fit to be taken up by the absorbent vessels; and at the same time the pressure on the excretory ducts hinders a superfluous excretion, while the fimbriated disposition of these excretories will not allow any of the secreted liquor to be pushed back again by these canals towards the glands.

MUCOCARNEOUS, a name whereby some authors call a sort of abscesses, which are partly made up of flesh, and partly of a thick mucous matter.

MUCOR, in botany, a genus of mushrooms, being funguses consisting of roundish little bladders, in which are found numerous seeds, affixed to hair-like receptacles, placed all over the inside of the bladders.

MUCOUS GLANDS, in anatomy, three glands, which empty themselves into the urethra; so called by their first discoverer, Mr. Cowper, from the tenacity of the liquor which they separate.

The two first of these are about the bigness of a french-bean, of a depressed oval figure, and a yellowish colour, like the prostates; being on each side the bulb of the cavernous body of the urethra, a little above it. Their excretory ducts spring from the internal surface, next the inner membrane of the urethra, into which they open a little lower, by two distinct orifices, just below its bending under the ossa pubis, in perinæo, where they discharge a transparent viscuous liquor. The third mucous gland is a small, conglobate, yellowish gland like the former, but somewhat less, situated above the angle of the flexure of the urethra, under the ossa pubis, in the perinæum, near the anus. It has two excretory ducts, which enter the urethra obliquely, a quarter of an inch below the two former, and discharges a liquor like them both in colour and consistence.

MUCOUS FEVER, a term used by medical writers, to express those fevers, in which nature is endeavouring to rid herself of an abundance of pituitous, mucous, and serous matter. The catarrhal fevers of all sorts are expressed under this denomination. See CATARRHAL FEVER.

MUCRO CORDIS, in anatomy, the lower or pointed end of the heart. See HEART.

MUCUS, a mucilaginous liquor separated by the mucous glands, and the nostrils. See the articles MUCOUS GLANDS, NOSTRILS, and GLAND.

The mucus of the urethra is a viscous transparent liquor, serving to line and lubricate the part, that the seed and the urine may slip more freely, without either adhering to, or lacerating the part. The mucus of the nostrils is a viscid excrementitious humour, separated by its proper glands, placed in the internal membrane of those parts, serving to moisten, lubricate, and defend the olfactory nerves which being extremely soft and naked, would, without such provision, be soon spoiled.

MUER, a town of Germany, in the circle of Austria, and dutchy of Stiria, situated on the river Muer, twenty-five miles north-west of Gratz.

MUER is also a river of Germany, which rises in Bavaria, and running east thro' the dutchy of Stiria, by Muer and Gratz, unites with the river Drave, at Legard, near Kanisha, in Hungary.

MUFFLE, in metallurgy, an arched cover, resisting the strongest fire, and made to be placed over coppels and tests in the operations of assaying, to preserve them from the falling of coals and ashes into them; though, at the same time, of such a form, as is no hindrance to the action of the air and fire on the metal, nor to the inspection of the assayer. The muffles may be made of any form, providing they have these conditions; but those used with coppels are commonly made semi-cylindrical; or when greater vessels are employed, in form of a hollow hemisphere. The muffle must have holes, that the assayer may look in; and the fore part of it must be always quite open, that the air may act better in conjunction with the fire, and be incessantly renewed: the apertures in the muffle serve also for the regimen of the fire, for the cold air rushing into the large opening before, cools the bodies in the vessel; but if some coals are put in it, and its aperture before be then shut, with a door fitted to it, the fire will be increased to the highest degree, much more quickly than it can be by the breathing holes of the furnace. Another use of these apertures is also, that the arsenical vapours of lead and antimony passing through the holes in the back part of the muffle, may not be offensive to the assayer, who stands before it. As to the height, length, and depth of the muffles, these must be proportioned to the size and number of the vessels they are intended to cover; and care must be taken in this, that all the parts of the inner surface of these vessels be in the reach of the assayer's eye. The most frequent size of the muffle is, however, four inches high,

ſix or eight long, and four or ſix inches broad. The ſegments cut off at the baſes, for the leſſer holes, muſt be of ſuch a proportioned height that the leaſt veſſels put under, may not be in the way of coals or aſhes falling into them. Wooden moulds of a proper ſhape are moſt convenient for making theſe muffles in, and the matter for making them, is the ſame with that of the german clay-teſts; that is, either of a pure native clay, of a condition to bear the fire, which will be known upon the trial; or ſuch clay hardened by a mixture of the powder of ſtones: and, in order to the forming of theſe, the maſs muſt be made tolerably ſoft and pliant, by kneading it on a flat ſtone; then ſpread it out evenly into a thin cake, ſomewhat longer and broader than you intend the muffle to be made; and ſo thick, that two or more thin plates, of about two lines thick each, may be cut off from it. One of thoſe thin plates being cut off from the cake, is to be rubbed over with oil or fat, and then laid over the mould; then cut out a ſemicircular piece from the maſs, of the ſame thickneſs with the former, and lay this on the back plane of the mould, joining the edges of this plate to thoſe of the former, wetting them well with water: another thin plate muſt be cut off, for the bottom of the muffle. The muffle thus made, let it be wetted, and carefully rubbed over, and then expoſed to the air, and afterwards baked in a baker's kiln, or aſſayer's oven.

MUFTI, or MUPHTI, the chief of the eccleſiaſtical order, or primate, of the muſſulman religion. The authority of the mufti is very great in the ottoman empire; for even the ſultan himſelf, if he would preſerve any appearance of religion, cannot, without hearing his opinion, put any perſon to death, or ſo much as inflict any corporal puniſhment. In all actions, eſpecially criminal ones, his opinion is required, by giving him a writing, in which the caſe is ſtated, under feigned names; which he ſubſcribes with the words, *He ſhall*, or *ſhall not be puniſhed*. Such outward honour is paid to the mufti, that the grand ſeignior himſelf riſes up to him, and advances ſeven ſteps to meet him, when he comes into his preſence. He alone has the honour of kiſſing the ſultan's left ſhoulder, whilſt the prime vizier kiſſes only the hem of his garment: when the grand ſeignior addreſſes any writing to the mufti, he gives him the following titles: "To the eſad, the wiſeſt of the wiſe; inſtructed in all knowledge; the moſt excellent of excellents; abſtaining from things unlawful; the ſpring of virtue and true ſcience; heir of the prophetic doctrines; reſolver of the problems of faith; revealer of the orthodox articles; key of the treaſures of truth; the light to doubtful allegories; ſtrengthened with the grace of the ſupreme legiſlator of mankind; may the moſt high God perpetuate thy virtues." The election of the mufti is ſolely in the grand ſeignior, who preſents him with a veſt of rich ſables, *&c.* If he is convicted of treaſon, or any great crime, he is put into a mortar, kept for that purpoſe in the Seven Towers at Conſtantinople, and pounded to death.

MUGGLETONIANS, a religious ſect, which aroſe in England, about the year 1657; ſo denominated from their leader Lodowick Muggleton, a journeyman taylor, who, with his aſſociate Reeves, ſet up for great prophets, pretending, as it is ſaid, to have an abſolute power of ſaving and damning whom they pleaſed; and giving out, that they were the two laſt witneſſes of God, that ſhould appear before the end of the world.

MUGIL, in ichthyology. See MULLET.

MUG-WORT, in botany, the ſame with the artemiſia. See ARTEMISIA.

Mug-wort has long been famous as an uterine and antiſpaſmodic, and a medicine of great power in all diſeaſes of the nerves. It is evidently aperient and abſtergent: it promotes the menſes, and cleanſes the womb. It is given in decoction, or, much more agreeably, in a light infuſion, in the manner of tea. The midwives uſe it externally, by boiling it, and applying it to the belly, to promote the menſtrual diſcharge, or the expulſion of the ſecundines. It is by ſome much recommended as a cure for the ſciatica, and is to be taken for this purpoſe, either in powder, two drams for a doſe; or the expreſſed juice drank, an ounce or two, twice a day, for ſome months.

MUID, a large meaſure, in uſe among the french, for things dry. The muid is no real veſſel uſed as a meaſure, but an eſtimation of ſeveral other meaſures, as the ſeptier, mine, minot, buſhel, *&c.* See the article MEASURE.

MUID is alſo one of the nine caſks, or regular veſſels uſed in France, to put wine and

and other liquors in. The muid of wine is divided into two demi-muids, four quarter-muids, and eight half-quarter-muids, containing 36 feptiers.

MUL, or MULL, one of the weftern iflands of Scotland, being part of the fhire of Argyle, and lying to the weftward of it: this ifland is twenty-four miles long, and in fome places as many broad.

MUL, or MULL *of Cantire*, the fouth cape or promontory of the county of Cantire or Mul, in the firth of Clyde, on the weft of Scotland.

MUL, or MULL *of Galloway*, the fouth cape or promontory of all Scotland, in the county of Galloway, on the Irifh fea.

MULATTO, a name given in the Indies to thofe who are begotten by a negro man on an indian woman, or an indian man on a negro woman.

MULBERRY, *morus*, in botany, a genus of the monoecia-tetrandria clafs of plants, having no corolla; the ftamina are four fubulated erect filaments, longer than the cup; there is no pericarpium; the cup is very large, carnofe, fucculent, and baccated, containing a fingle ovato-acute feed.

The leaves of this tree are ufed for feeding filkworms, for which purpofe it fhould not be allowed to grow tall, but kept in a fort of hedge; and inftead of pulling off the leaves fingly, they fhould be cut off with fheers, together with the young branches. See SILKWORM.

MULCT, a fine of money laid upon a man, who has committed fome fault or mifdemeanor.

MULCH, a term ufed by gardeners for rotten dung, or the like, thrown upon beds of young plants, to preferve them from the bad effects of cold or drought.

MULDAW, a river of Bohemia, that arifes on the confines of Auftria, and, running north, through Bohemia, unites with the Elbe at Melnick.

MULDORF, a town of Germany, in the circle of Bavaria, fituated on the river Inn, forty miles eaft of Munich.

MULE, in zoology, a mongrel kind of quadruped, ufually generated between an afs and a mare, and fometimes between a horfe and a fhe-afs. The mule is a fort of a monfter, of a middle nature between its parents, and therefore incapable of propagating its fpecies; fo careful is nature to avoid filling the world with monfters. Mules are chiefly ufed in countries where there are rocky and ftony roads, as about the Alps, Pyrenees, &c. Great numbers of them are kept in thefe places; they are ufually black, ftrong, well limbed, and large, being moftly bred out of the fine fpanifh mares: the mules are fometimes fifteen or fixteen hands high. No creatures are fo proper for carrying large burdens, and none fo fure footed. They are much ftronger for draught than our horfes, and are often as thick-fet as our dray-horfes; and they will travel feveral months together, with fix or eight hundred weight upon their backs: they are much hardier and ftronger than horfes, and will live and work twice the age of a horfe; and thofe mules which are light are fitter for riding than horfes, as to the walk and trot; but they are apt to gallop rough.

MULHAUSEN, a town of Germany, in the landgravate of Alface, fituated on the river Ill, forty miles fouth of Strafburg.

MULHAUSEN, is alfo a town of Germany, in the circle of upper Saxony, and territory of Thuringia, fituated fixteen miles north-weft of Sax gotha.

MULIEBRIA, a term ufed to fignify the privities of women.

MULIER, in law, fignifies the lawful iffue born in wedlock, though begotten before. The mulier is preferred to an elder brother born out of matrimony; as, for inftance, if a man has a fon by a woman before marriage, which iffue is a baftard, and afterwards marries the mother of the baftard, and they have another fon, this fecond fon is mulier and lawful, and fhall be heir of the father, but the other can be heir to no perfon. See the article BASTARD.

By the civil law, where a man has iffue by a woman, if after that he marries her, the iffue is mulier.

MULIERTY, fignifies the condition of a mulier, or lawful iffue.

MULLER, or MULLAR, denotes a ftone flat and even at the bottom, but round a-top, ufed for grinding of matters on a marble. The apothecaries ufe mullers to prepare fome of their teftaceous powders, and painters for their colours, either dry or in oil.

Muller is alfo an inftrument ufed by the glafs-grinders; being a piece of wood, to one end whereof is cemented the glafs to be ground. It is ordinarily about fix inches long, turned round. See the article GLASS-GRINDING.

MULLERAS, a town of Germany, in the circle of Upper Saxony, and marquisate of Brandenburg, situated thirty-eight miles south-east of Berlin.

MULLET, *mugil*, in ichthyology, a genus of the acanthopterygeous fishes, the head of which is of a depressed form in the anterior part, and the body oblong and compressed. On each side of the head, below the nostrils, there stands a little bone, which is serrated on its lower part; the eyes are not covered with a skin; and there are teeth on the tongue and palate, but none in the jaws or fauces; the branchiostege membrane on each side contains six ossicles; these are of a crooked figure, and the upper one, which is the broadest, is covered by the coverings of the gills in such a manner, that only five appear.

MULLET is also a name for several species of the trigla. See TRIGLA.

MULLET, or MOLLET, in heraldry, a bearing in form of a flat, or rather of the rowel of a spur, which it originally represented.

The mullet has but five points; when there are six it is called a star; tho' others make this difference, that the mullet is, or ought to be always pierced, which a star is not. See plate CLXXXI. fig. 2. The mullet is usually the difference or distinguishing mark for the fourth son, or third brother, or house; though it is often borne alone, as coat-armour.

MULLUS, the same with mullet. See the article MULLET.

MULSUM, MULSE, a liquor made of wine and honey, or even of wine and water. See the article HYDROMEL.

MULTA, or MULTURA EPISCOPI, is said to be a satisfaction antiently made to the king by the bishops, in order that they might have power to make their last wills and testaments; and have the probate of the wills of other men, and also the granting of administrations.

MULTAN, or MOUTAN, a city of hither India in Asia, capital of the province of Multan, situated on the river Indus, east long. 72° 15', north lat. 30°.

MULTANGULAR, a figure, or body, which has many angles.

MULTILATERAL, in geometry, is applied to those figures which have more than four sides or angles, more usually called polygons. See the article POLYGON.

MULTINOMIAL, or MULTINOMIAL ROOTS, in mathematics, such roots as are composed of many names, parts, or members; as $a+b+d+c$, &c. See the article ROOT.

MULTIPLE, *multiplex*, in arithmetic, a number which comprehends some other several times, thus 6 is a multiple of 2, and 12 is a multiple of 6, 4, and 3, comprehending the first twice, the second thrice, *&c.*

MULTIPLE RATIO, or PROPORTION, is that which is between multiples. If the lesser term of the ratio be an aliquot part of the greater, the ratio of the greater to the less is called multiple; and that of the less to the greater submultiple. A submultiple number is that contained in the multiple; thus, the numbers 1, 2, and 3, are submultiples of 9. Duple, triple, *&c.* ratios, as also subduples, subtriples, *&c.* are so many species of multiple and submultiple ratios. See the article RATIO.

MULTIPLICAND, in arithmetic, one of the factors in the rule of multiplication; being that number which is given to be multiplied by another, which is called the multiplicator, or multiplier.

MULTIPLICATION, in general, the act of increasing the number of any thing.

Multiplication, in arithmetic, is a rule by which any given number may be speedily increased, according to any proposed number of times.

Multiplication, which is the fourth rule in arithmetic, serves instead of many additions; the product of a multiplication being only the repetition of the multiplicand so many times, as there are units in the multiplier.

Case I. To multiply single numbers by one another.

All the variety that can happen in this case is expressed in the following table of multiplication, which must be perfectly got by heart, for the ready performance of any operation in multiplication: thus we learn, by the table, that 3 times 3 is 9; that 3 times 6 is 18, *&c.* We have in this table, omitted multiplying with 2, it being so very easy that any one may do it.

MULTIPLICATION TABLE.

3×3= 9	4×4=16	5×5=25	6×6=36	7×7=49	8×8=64
3×4=12	4×5=20	5×6=30	6×7=42	7×8=56	8×9=72
3×5=15	4×6=24	5×7=35	6×8=48	7×9=63	9×9=81
3×6=18	4×7=28	5×8=40	6×9=54		
3×7=21	4×8=32	5×9=45			
3×8=24	4×9=36				
3×9=27					

Case II. To multiply a compound number by a single one.

Rule. Having placed the multiplier under the unit's place of the multiplicand; first, multiply the unit of the multiplicand by the multiplier; if their product be less than ten, set it down underneath its own place of units, and proceed to the next figure of the multiplicand: but if their product be above ten, or tens, then set down the overplus only, or odd figure, as in addition, and carry the said ten or tens in mind, till you have multiplied the next figure of the multiplicand with the multiplier: then, to their product add the ten or tens beared in mind, setting down the overplus of their sum above the tens, as before; and so proceed in that manner until all the figures of the multiplicand are multiplied with the multiplier.

Example. Suppose it were required to multiply 3213 by 3.

3213 Multiplicand.
3 Multiplier.
9639

For, beginning at the unit's place 3, say 3 times 3 is 9, which, because it is less than ten, set down underneath its own place, and proceed to the next place of tens, saying 3 times 1 is 3, which set down underneath its own place; then at the next place, *viz.* of hundreds, say 3 times 2 is 6, which set down as before; lastly, at the place of thousands, say 3 times 3 is 9, which being set down underneath its own place, the operation is finished, and the true product is 9639.

Case III. To multiply one compound number by another.

Rule. Place every number respectively under its own kind: multiply each figure of the multiplicand by each figure of the multiplier as before; and observe to set the first figure of each respective product under that figure of the multiplier, by which it was made; lastly, add the several products together for the whole product.

Example 1. Let it be required to multiply 78094 by 7563.

The operation. 78094 Multiplicand.
7563 Multiplier.

234282 The first particular product with 3.
468564 The second particular product with 60.
390470 The third particular product with 500.
546658 The fourth particular product with 7000.

590624922 The total, or true product required.

When there is a cypher or cyphers to the right hand, either of the multiplicand or multiplier, or to both, in that case, multiply the figures as before, neglecting the cyphers until the particular products are added together; then to their sum annex so many cyphers as there are in either or both the factors, as in the following examples.

Example 2.
9538
4600
57228
38152
43874800

Example 3.
87600
79
7884
6132
6920400

Example 4.
785000
56900
7065
4710
3925
44666500000

If

If it be required to multiply any number by 10, 100, 1000, 10000, *&c.* it is only annexing the cyphers of the multiplier to the figures of the multiplicand, and the work is done: thus 578×10=5780, 578×100=57800, 578×1000=578000, 578×10000=5780000, *&c.* If a quantity be multiplied by the component part of the multiplier, the product will be the same as if it had been multiplied by the multiplier itself: thus, 245 by 7, and the product by 6 is the same as if 245 was multiplied by 7×6, that is by 42.

For the proof of multiplication, it is to be observed that the product is then right when being divided by the multiplier it quotes the multiplicand; or divided by the multiplicand it quotes the multiplier. See the article DIVISION.

Cross MULTIPLICATION, otherwise called duodecimal arithmetic, is an expeditious method of multiplying things of several species, or denominations, by others likewise of different species, *&c. e. g.* Shillings and pence, by shillings and pence; feet and inches, by feet and inches.

This is much used in measuring, *&c.* and the method is thus:

Suppose 5 feet 3 inches to be multiplied by 2 feet 4 inches; say 2 times 5 feet is 10 feet, and 2 times 3 is 6 inches; again, say 4 times 5 is 20 inches, or 1 foot 8 inches; and 4 times 3 is 12 parts, or 1 inch: the whole sum makes 12 feet 3 inches. In the same manner you may manage shillings and pence, *&c.*

F.	I.
5	3
2	4
10	6
1	8
	1
12	3

For the multiplication of vulgar and decimal fractions, see the articles FRACTION and DECIMAL.

MULTIPLICATION, in algebra. The general rule for the signs is, that when the signs of the factors are alike (*i. e.* both + or both —) the sign of the product is +; but when the signs of the factors are unlike, the sign of the product is —.

Case 1. When any positive quantity, $+a$, is multiplied by any positive number, $+n$, the meaning is, that $+a$ is to be taken as many times as there are units in n; and the product is evidently na.

Case 2. When $-a$ is multiplied by n, then $-a$ is to be taken as often as there are units in n; and the product must be $-na$.

Case 3. Multiplication by a positive number implies a repeated addition: but multiplication by a negative implies a repeated subtraction. And, when $+a$ is to be multiplied by $-n$, the meaning is that $+a$ is to be subtracted as often as there are units in n: therefore the product is negative, being $-na$.

Case 4. When $-a$ is to be multiplied by $-n$, then $-a$ is to be subtracted as often as there are units in n; but to subtract $-a$ is equivalent to adding $+a$, consequently the product is $+na$. The second and fourth cases may be illustrated in the following manner:

It is evident that $+a-a=0$; therefore if we multiply $+a-a$ by n, the product must vanish or be 0, because the factor $a-a$ is 0. The first term of the product is $+na$ (by case 1.) Therefore, the second term of the product must be $-na$, which destroys $+na$; so that the whole product must be $+na-na=0$. Therefore, $-a$ multiplied by $+n$ gives $-na$.

In the like manner, if we multiply $+a-a$ by $-n$, the first term of the product being $-na$, the latter term of the product must be $+na$, because the two together must destroy each other, or their amount 0, since one of the factors (viz. $a-a$) is 0. Therefore, $-a$ multiplied by $-n$ must give $+na$.

If the quantities to be multiplied are simple, find the sign of the product by the last rule; after it place the product of the co-efficients, and set down all the letters after one another as before.

EXAMPLES.

Mult.	$+a$	$-2a$	$+6x$
By	$+b$	$+4b$	$-5a$
Product	$+ab$	$-8ab$	$-30ax$.

Mult.	$-8x$	$+3ab$
By	$-4a$	$-5ac$
Product	$+32ax$	$-15aabc$.

To multiply compound quantities, you must multiply every part of the multiplicand by all the parts of the multiplier taken one after another, and then collect all the products into one sum; the sum shall be the product required.

Mult.	$a+b$
By	$a+b$
Prod.	$aa+ab$
	$+ab+bb$
Sum	$aa+2ab+bb$

$2a-3b$
$4a+5b$
$8aa-12ab$
$+10ab-15bb$
$8aa-2ab-15bb$

Mult.

$$\begin{array}{ll} \text{Mult.} & 2a - 4b \\ \text{By} & 2a + 4b \\ \hline \text{Prod.} & \left\{ \begin{array}{l} 4aa - 8ab \\ \quad + 8ab - 16bb \end{array} \right. \\ \hline \text{Sum} & 4aa \ldots 0. - 16bb \end{array} \qquad \begin{array}{l} xx - ax \\ x + a \\ \hline \left\{ \begin{array}{l} xxx - axx \\ \quad + axx - aax \end{array} \right. \\ \hline xxx \ldots 0. \ldots - aax \end{array}$$

$$\begin{array}{ll} \text{Mult.} & aa + ab + bb \\ \text{By} & a - b \\ \hline \text{Prod.} & \left\{ \begin{array}{l} aaa + aab + abb \\ \quad - aab - abb - bbb \end{array} \right. \\ \hline \text{Sum} & aaa \ldots 0 \ldots 0 \ldots 0 \ldots - bbb \end{array}$$

Products that ariſe from the multiplication of 2, 3, or more quantities as $a\ b\ c$, are ſaid to be of 2, 3, or more dimenſions; and thoſe quantities are called factors or roots.

If all the factors are equal, then theſe products are called powers; as $a\ a$ or $a\ a\ a$ are powers of a. Powers are expreſſed ſometimes by placing, above the root to the right hand, a figure expreſſing the number of factors that produce them, thus:

a	1ſt	power of the	a
aa	2d	root a, and	a^2
aaa	3d	is generally	a^3
$aaaa$	4th	expreſſed	a^4
$aaaaa$	5th	thus:	a^5

Theſe figures which expreſs the number of factors that produce powers are called their indices or exponents; thus 2 is the index of a^2. And powers of the ſame root are multiplied by adding their exponents thus: $a^2 \times a^3 = a^5$. $a^4 \times a^3 = a^7$. $a^3 \times a = a^4$.

Sometimes it is uſeful not actually to multiply compound quantities, but to ſet them down upon the ſign of Multiplication (×) between them, drawing a line over each of the compound factors. Thus $\overline{a+b} \times \overline{a-b}$ expreſſes the product of $a+b$ multiplied by $a-b$.

MULTIPLICATION of ſurds. See SURDS.

MULTIPLICATOR, or MULTIPLIER, in arithmetic, a number multiplying another called the multiplicand. See MULTIPLICAND and MULTIPLICATION.

The larger number is generally made the multiplicand, and is placed above the ſmaller, or multiplicator: but the reſult is the ſame, which ſoever of the numbers be made multiplicand, or multiplier.

MULTIPLYING GLASS, in optics, one wherein objects appear increaſed in number.

It is otherwiſe called a polyhedron, being ground into ſeveral planes, that make angles with each other; through which the rays of light iſſuing from the ſame point undergo different refractions, ſo as to enter the eye from every ſurface in a different direction.

MULTISILIQUOUS PLANTS, thoſe which have after each flower many diſtinct, long, ſlender, ſiliquæ or pods, in which their ſeed is contained: ſuch are bear's foot, columbine, houſe-leek, navel-wort, orpine, *&c.*

MULTITUDE, an aſſemblage, or collection of a great number of diſtinct perſons or things: thus we ſay, a multitude of men, of horſes, of trees, *&c.*

The units, or individuals, that make a multitude, may be of the ſame or different kinds, and natures of things; and that whether they are really ſeparated from one another, or only diſtinguiſhed by the imagination.

MULTIVALVES, in natural hiſtory, the name of a general claſs of ſhell-fiſh diſtinguiſhed from the univalves, which conſiſt of only one ſhell, and the bivalves, which conſiſt of two, by their conſiſting of three or more ſhells. See SHELL, UNIVALVES, and BIVALVES.

Of theſe there are much fewer ſpecies, than either of the univalve or bivalve claſs. A late accurate French author has ranked all the ſpecies under ſix genera, which are theſe: 1. The *echini* or ſea-eggs. 2. The *vermiculi* or ſea-worms. 3. *Balani* or center-ſhells. 4. The *pollipicides* or thumb-ſhells. 5. The *conchæ anatiferæ* or gooſe-ſhells. And 6. The *pholades.*

MULVIA, a river of Barbary, in Africa, which riſes in the mountains of Atlas, and divides the empire of Morocco from the kingdom of Algiers, and then falls into the Mediterranean, weſt of Marſalquiver.

MUM, a kind of malt-liquor, much drank in Germany; and chiefly brought from Brunſwick, which is the place of moſt note for making it. The proceſs of brew-

ing

ing mum, as recorded in the town-houfe of that city, is as follows: Take fixty-three gallons of water that has been boiled till one-third part is confumed, and brew it with feven bufhels of wheaten-malt, one bufhel of oat-meal, and one bufhel of ground beans; when it is tunned, the hogfhead muft not be filled too full at firft; as foon as it begins to work, put into it three pounds of the inner rind of fir; one pound of the tops of fir and beach; three handfuls of carduus benedictus; a handful or two of the flowers of rofa folis; add burnet, betony, marjoram, avens, penny-royal, and wild thyme, of each a handful and a half; of elder-flowers, two handfuls or more; feeds of cardamum bruifed, thirty ounces; barberries bruifed, one ounce; when the liquor has worked a while, put the herbs and feeds into the veffel; and, after they are added, let it work over as little as poffible; then fill it up: laftly, when it is ftopped, put into the hogfhead ten new-laid eggs unbroken; ftop it up clofe, and drink it at two years end. Our englifh brewers, inftead of the inner rind of fir, ufe cardamum, ginger, and faffafras; and alfo add elecampane, madder, and red-fanders.

Mum, on being imported, pays for every barrel 1 l. 5 s.

MUMMY, a body embalmed or dried, in the manner ufed by the antient Egyptians: or the compofition with which it is embalmed. There are two kinds of bodies denominated mummies: the firft are only carcafes dried by the heat of the fun, and by that means kept from putrefaction: Thefe are frequently found in the fands of Lybia. Some imagine, that thefe are the bodies of deceafed people buried there on purpofe to keep them intire without embalming; others think they are the carcaffes of travellers, who have been overwhelmed by the clouds of fand raifed by the hurricanes frequent in thofe deferts. The fecond kind of mummies are bodies taken out of the catacombs, near Cairo, in which the Egyptians depofited their dead after embalming. For a further account of mummies, and the manner of embalming dead bodies, fee EMBALMING.

We have two different fubftances preferved for medicinal ufe under the name of mummy, though both in fome degree of the fame origin: the one is the dryed and preferved flefh of human bodies, embalmed with myrrh and fpices; the other is the liquor running from fuch mummies, when newly prepared, or when affected by great heat or damps. This latter is fometimes in a liquid, fometimes of a folid form, as it is preferved in vials well ftopped, or fuffered to dry and harden in the air. The firft kind of mummy is brought to us in large pieces, of a lax and friable texture, light and fpungy, of a blackifh brown colour, and often damp and clammy on the furface: it is of a ftrong but difagreeable fmell. The fecond kind of mummy in its liquid ftate, is a thick opake and vifcous fluid, of a blackifh colour, but not difagreeable fmell. In its indurated ftate, it is a dry folid fubftance, of a fine fhining black colour, and clofe texture, eafily broken, and of a good fmell; very inflammable, and yielding a fcent of myrrh, and aromatic ingredients while burning. This, if we cannot be content without medicines from our own bodies, ought to be the mummy ufed in the fhops; but it is very fcarce and dear, while the other is fo cheap, that it will always be moft in ufe.

All thefe kinds of mummy are brought from Egypt, but we are not to imagine, that any body breaks up the real egyptian mummies, to fell them in pieces to the druggifts, as they may make a much better market of them in Europe whole, when they can contrive to get them. What our druggifts are fupplied with, is the flefh of executed criminals, or of any other bodies the Jews can get, who fill them with the common bitumen, fo plentiful in that part of the world; and adding a little aloes, and two or three other cheap ingredients, fend them to be baked in an oven, till the juices are exhaled, and the embalming matter has penetrated fo thoroughly that the flefh will keep, and bear tranfporting into Europe. Mummy has been efteemed refolvent and balfamic; but whatever virtues have been attributed to it, feem to be fuch as depend more upon the ingredients ufed in preparing the flefh, than in the flefh itfelf; and it would furely be better to give thofe ingredients without fo fhocking an addition.

Befides the mummy, the human body has been made to furnifh many other fubftances for medicinal purpofes: Thus the fkull has been celebrated for its imaginary virtues againft the difeafes of the head: the very mofs growing on the fkulls of human fkeletons, has been fuppofed

posed to possess anti-epileptic virtues: the fat of the human body has been recommended as good in rheumatisms; and the blood, and in short, every other part or humour of the body, have, at one time or other, been in repute for the cure of some disease: but at present we are grown wise enough to know, that the virtues ascribed to the parts of the human body are either imaginary, or such as may be found in other animal substances. The mummy, and skull alone, of all these horrid medicines, retain their places in the shops; and it were to be wished that they too were rejected.

MUMMY, among gardeners, a kind of wax used in grafting and planting the roots of trees, made in the following manner: Take one pound of black pitch, and a quarter of a pound of turpentine; put them together into an earthen pot, and set them on fire in the open air, holding something in your hand to cover and quench the mixture in time, which is to be alternately lighted and quenched till all the nitrous and volatile parts be evaporated. To this a little common wax is to be added; and the composition is then to be set by for use.

Dr. Agricola directs its being used in planting pieces of the roots of trees, in the following manner: melt it, and having let it cool a little, dip in the two ends of the pieces of root, one after another; then put them in water, and plant them in the earth, the small end downward, so that the larger may appear a little way out of the earth, in order to have the benefit of the air; then press the earth hard down about them, that they may not receive too much wet. This work he recommends to be performed in the months of September, October, and November.

This author recommends several other kinds of mummies, but as the ingredients are much the same, it would be to little purpose to insert them.

MUNDIC, in natural history, a metallic mineral, more commonly called marcasite. See the article MARCASITE.

MUNDIFICATIVES, in pharmacy, the same with cleansers or detergents. See DETERGENTS and VULNERARY.

MUNGATS, or MUNKATS, a town of upper Hungary: east long. 22°, north lat. 48° 30'.

MUNGO, or MUNGATHIA, an animal of the ferret-kind, of a reddish grey colour.

MUNICH, or MUNCHEN, a large and elegant city, the capital of the electorate and dutchy of Bavaria, situated on the river Iser: east long. 11° 32', north lat. 48° 5'.

MUNICIPAL, in the roman civil law, an epithet which signifies invested with the rights and privileges of roman citizens. Thus the municipal cities were those whose inhabitants were capable of enjoying civil offices in the city of Rome: these cities, however, according to Mariana, had fewer privileges than the colonies: they had no suffrages or votes at Rome: but were left to be governed by their own laws and magistrates. Some few municipal cities, however, obtained the liberty of votes.

Municipal, among us, is applied to the laws that obtain in any particular city or province. And those are called municipal officers who are elected to defend the interest of cities, to maintain their rights and privileges, and to preserve order and harmony among the citizens. Such as mayors, sheriffs, consuls, &c.

MUNIMENTS, or MINIMENTS, the writings relating to a person's inheritance, by which he is enabled to defend his title to his estate: or, in a more general sense, all manner of evidences, such as charters, feofments, releases, &c.

MUNIMENT HOUSE, a little strong room in a cathedral, college, or university, destined for keeping the seal, charters, &c. of such cathedral, college, &c.

MUNIONS, in architecture, are the short, upright posts or bars which divide the several lights in a window frame.

MUNITION, the provisions with which a place is furnished in order for defence; or that which follows a camp for its subsistance. See AMMUNITION.

MUNITION SHIPS, are those that have stores on board in order to supply a fleet of men of war at sea. In an engagement, all the munition ships, and victuallers attending the fleet, take their stations in the rear of all the rest; they are not to engage in the fight, but to attend such directions as are sent them by the admiral.

MUNSTER, the capital of the bishopric of the same name, and of the circle of Westphalia, situated on the river Aa: east long. 7° 10', north lat. 52°.

MUNSTER, is also a town of Germany, in the Landgraviate of Alsatia, subject to France: east long. 7° 5', north lat. 48° 8'.

MUNSTER MEINFELT, a town of Germany,

many, in the circle of the lower Rhine, and electorate of Triers: east long. 7°, north lat. 50° 15′.

MUNSTERBERG, the capital of the dutchy of the same name in Silesia: east long. 16° 40′, north lat. 50° 35′.

MUNTINGIA, in botany, a genus of the polyandria-monogynia class of plants, the corolla whereof consists of five roundish petals, of the length of the cup; they are patent, and are inserted in the cup; the fruit is a round unilocular berry, umbilicated with the stigma; the seeds are numerous, roundish, and small.

MUPHTI. See the article MUFTI.

MURÆNA, in ichthyology, a genus of the malcopterigious class of fishes, the body of which is long, slender, and rounded; or subcylindric in some species: the fins are three, in others they are four, and in some again there is only one; at the very extremity of the rostrum there are two short tubes or foramina, one on each side, and these are the anterior apertures of the nostrils; the branchiostege membrane on each side contains ten slender and crooked bones, but the skin of the flesh is thick and firm; so that till it is taken off, they are not easily discovered. This genus contains the common eel, and the conger or sea-eel. See EEL.

The other species of this genus are the sea serpent, the flat-tailed sea-serpent, the spotted sea-serpent, and the muræna simply so called. The sea serpent is the cylindric muræna, with the tail naked and acute, and has vastly the appearance of the serpent kind; it grows to five feet in length, and to the thickness of a man's wrist; the head is small and the rostrum acute, but the opening of the mouth is very large, and furnished with a vast number of very sharp and strong teeth, of unequal sizes; the eyes are small, their iris of a gold-yellow, and the pupil round and black; the pectoral fins stand just at the opening of the gills, are very small, and have each sixteen rays. The flat-headed sea-serpent is the muræna, with the snout sharp and spotted with white, and with the edge of the back-fin black; this has much the general resemblance of the common eel, it grows to between three and four feet in length, and as thick as a man's wrist. The spotted sea-serpent is the slender spotted muræna, with a pointed naked tail, growing to four feet in length, and not thicker than an eel of but two and a half. The muræna simply so called, is that with no pectoral fins, being a singular species, having only one fin, which is the pinna dorsi, surrounding the tail and running up to the anus; it grows to two feet in length, and to the thickness of an eel of the same length.

MURAGE, a toll taken of every cart or horse coming laden into a city, for repairing the walls.

MURAL, in general, any thing belonging to a wall, which the latins call murus.

MURAL ARCH, is a wall, or walled arch, placed exactly in the plane of the meridian, for fixing a large quadrant, sextant, or other instrument, in order to observe the meridian altitudes of the heavenly bodies.

MURAL CROWN. See the article CROWN.

MURCIA, the capital of the province of the same name in Spain: west long. 1° 12′, north lat. 38° 6′.

MURDER, or MURTHER, in law, is the wilful and felonious killing a person from premeditated malice; provided the party wounded or otherwise hurt, die within a year and a day after the fact was committed.

It is malice, and not the bare killing that constitutes the crime of murder, which is either expressed or implied; expressed, when it is proved that there was some ill will, or grudge, before the killing, and that the fact was done with a sedate mind, and a formed design of doing it: and implied, where a person kills another suddenly, having nothing to defend himself, as in going along a street, over a field, or the like. That murder which is perpetrated through a direct purpose to do some personal injury to the person slain, is said to be of express malice; and such as happens in the execution of an illegal action, that was principally designed for some other purpose, and not manifested in its nature to do a personal injury to him who is killed, is most properly malice implied. Where a person voluntarily commits any violent or cruel act, which is attended with death, in the eye of the law he is looked upon as doing it out of malice aforethought; as where a man in cool blood maliciously beats another, in such a manner, beyond any apparent design of chastisement, that he dies: this is murder by express malice, though there is no other proof that he intended to kill him. Where a person declares a resolution to kill the first man he meets, and does kill him, it is murder; because in this case malice is

implied

implied againſt all mankind. Where two or more perſons aſſemble together, in order to commit ſome unlawful act, and one of them, by chance, kills another; this is murder in all that are preſent; and ſuch perſons are conſtrued to be preſent, if they are in the ſame houſe, though in another room; or if in the ſame park, tho' they are half a mile off. Where poiſon is laid, in order to kill a particular perſon, and another accidentally takes it, and dies, it is murder in the perſon who laid the poiſon. See the article MANSLAUGHTER.

By a late act, all perſons found guilty of wilful murder, are to be executed on the day next but one after ſentence paſſed, unleſs that day happens to be a Sunday; and in that caſe, they are to be executed on the Monday following. The judge may direct the body to be hung in chains, or to be delivered to the ſurgeons, in order to its being diſſected and anatomized; but in no caſe whatſoever is it to be buried, till after it is diſſected.

MURDERERS, or MURDERING PIECES, in a ſhip, are ſmall pieces of ordnance, either of braſs or iron, which have chambers put in at their breeches. They are uſed at the bulk-heads of the fore-caſtle, half-deck, or ſteerage, in order to clear the deck, on the ſhip's being boarded by an enemy.

MURENGERS, two officers of great antiquity in the city of Cheſter, annually choſen out of the aldermen, to ſee that the walls are kept in repair, and to receive a certain toll and cuſtom, for the maintenance thereof.

MURET, a town of France, in the province of Gaſcony, twelve miles ſouth of Toulouſe.

MUREX, in natural hiſtory, a genus of univalve or ſimple ſhells, without any hinge, formed of a ſingle piece, and beſet with tubercles or ſpines: the mouth is large and oblong, and has an expanded lip, and the clavicle is rough.

The animal, which inhabits this ſhell, is called limax, or ſnail. See SNAIL.

The clavicle of the murex is in ſome ſpecies elevated, in others depreſſed; and the mouth is ſometimes dentated, and at others ſmooth: the lip alſo in ſome is digitated, in others elated, and in ſome laciniated; and the columella is in ſome ſmooth, in others rugoſe.

Of this genus there are a great many very elegant ſpecies, among which is, the ſpider-ſhell, or rugoſe murex, with a protended lip, and ſix long cornicles, or legs; which grows to three inches in length, and two and a half in diameter; its general colour being a tawny brown, variegated with darker clouds: and the ribbed muſic-ſhell, or obſcurely coſtated murex, with ſtriated zones: it is about two inches long, and near an inch and half in diameter; its ground-colour is a whitiſh brown, and it is ſurrounded with three or four elegant zones, formed of four or five parallel black lines, with ſpots of a blackiſh or rediſh colour between them; reſembling very much the lines in which muſic is written, with the marks of crotchets, &c. whence the name. There is alſo a leſſer muſic-ſhell, rather more elegant than the former.

MURING, among builders, the raiſing of walls. See the article WALL.

MURIA, ALIMENTARY SALT, in natural hiſtory. See the article SALT.

MURO, a town of Italy, in the kingdom of Naples, ſixty miles ſouth-eaſt of the city of Naples.

MURRAIN, or GARGLE, a contagious diſeaſe among cattle, principally cauſed by a hot dry ſeaſon, or rather by a general putrefaction of the air, which begets an inflammation of the blood, and a ſwelling in the throat, that ſoon prove mortal, and is communicated from one to another, though it generally goes no farther than to thoſe of the ſame kind.

The ſymptoms of this diſeaſe are a hanging down and ſwelling of the head, abundance of gum in the eyes, rattling in the throat, a ſhort breath, palpitation at the heart, ſtaggering, a hot breath, and a ſhining tongue.

In order to prevent this diſeaſe, the cattle ſhould ſtand cool in ſummer, have plenty of good water; all carrion ſhould be ſpeedily buried, and as the feeding of cattle in wet places, on rotten graſs and hay, often occaſions this diſeaſe, dry and ſweet fodder ſhould be given them. The following receipt is much recommended for the cure of this diſeaſe in black cattle: Take diapente, a quarter of an ounce; dialthæa or marſhmallows, london treacle, mithridate and rhubarb, of each the quantity of a nut; of ſaffron, a ſmall quantity; wormwood, and red ſage, of each an handful; and two cloves of garlick: boil all together in two pints of beer, till it be reduced to a pint and a half, and give it the beaſt luke-warm, while faſting: half the proportion will ſerve for a cow; they muſt be kept warm,

and take a mash of ground malt, drinking warm water for a week, and sometimes have boiled oats. If sheep are troubled with this distemper, give them a few spoonfuls of brine, and then a little tar.

MURRAY, a county of Scotland, bounded by the German Sea, on the north; by Bamf, on the east; by Mar and Badenoch, on the south; and by Inverness, on the west.

MURREY, in heraldry, a kind of purple colour. See the article SANGUINE.

MURRHINE, or MORRHINE VESSELS, in antiquity, a kind of porcellain-ware, used in cups and vases; though some will have them to have been made of a precious stone, of the agate-kind.

There were also murrhine vessels, made at Diospolis, in Egypt; which was a kind of glass-ware, made in imitation of the true sort, brought from India.

MURTHER, or MURDER. See MURDER.

MURTHERING PIECES, or MURDERERS. See the article MURDERERS.

MUS, in zoology, a genus of quadrupeds, of the order of the agriæ, the characters of which are these: the fore-teeth are acute, and there are no canine teeth at all; the feet are divided, and the ears naked.

Of this genus there are a great many species, known by distinct english names; as the rat, mouse, dor-mouse, or sorex, citille, agutis, guinea-pig, &c. See the article RAT, MOUSE, &c.

MUSA, the PLANTAIN-TREE, in botany, a genus of the polygamia class of plants, the flower of which consists of two petals; one of which is erect, and divided by five indentings at the edge; and the other is hollow, shorter, and nectariferous: the stamina are six; and the fruit is an oblong, triquetrous berry.

MUSCA, the FLY, in zoology. See FLY.

MUSCÆ VOLITANTES, certain dark spots, seen by many people on looking at the sky, a candle, or other bright object; so called from their resembling flies. See the article EYE.

MUSCADINE, a rich kind of wine, of the growth of Provence and Languedoc, in France. See the article WINE.

MUSCLE, *musculus*, in anatomy, a part of the human body, destined to move some other part, and that in general by a voluntary motion, or such as is dictated by the will; being composed principally of flesh and tendinous fibres, which have also vessels of all kinds, as arteries, veins, nerves, and lymphatics; all which are surrounded by, or enclosed in, one common membrane.

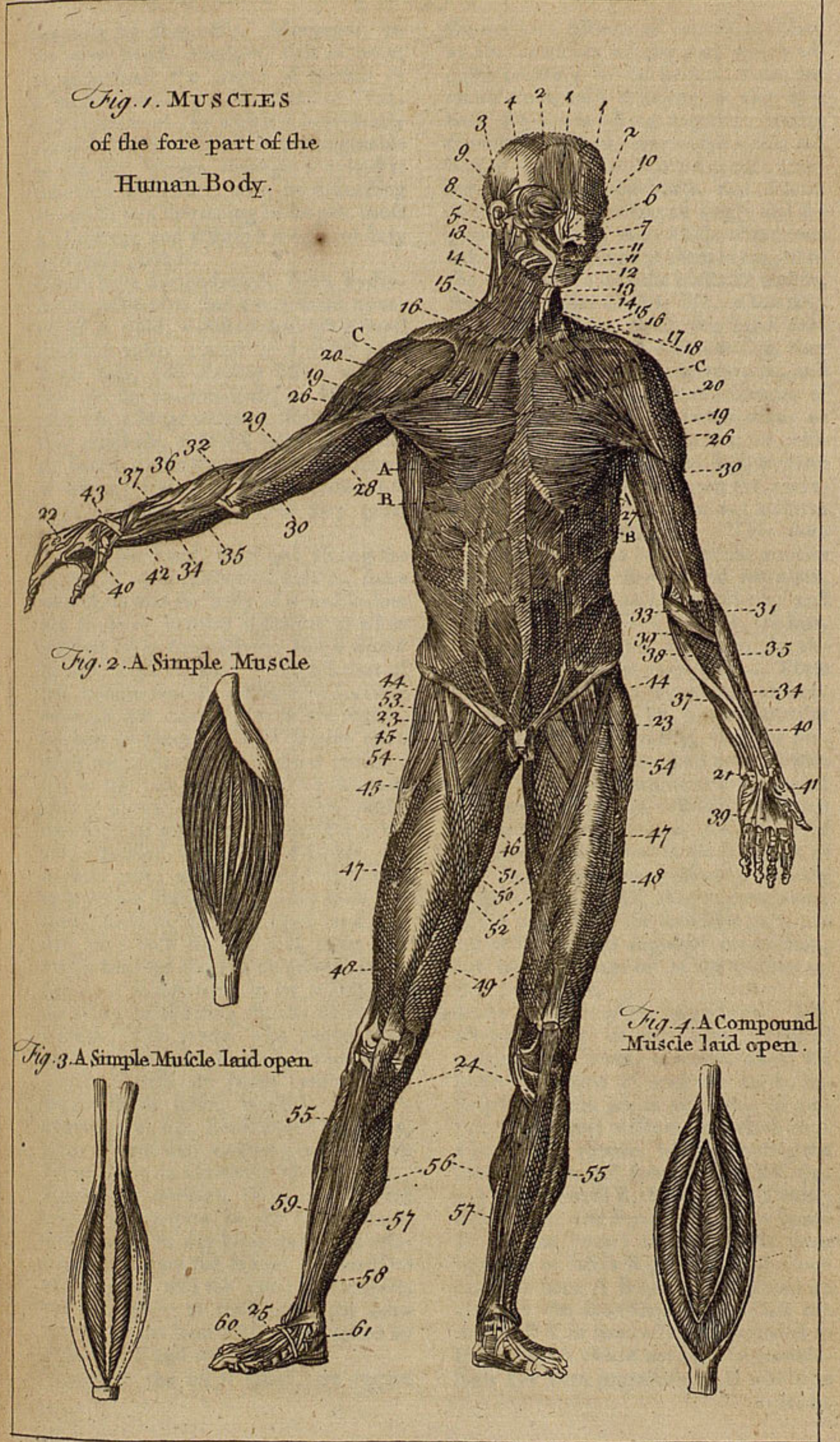
The muscular fibres are, according to the action they are intended for, of various directions; some streight, others oblique, transverse, annular, and spiral. Some consist of one uniform series of fibres, and on that account are called simple; others are composed of various, and often contrary courses of fibres, and these being closely arranged together, the large one seems to be made up of a number of lesser muscles, and is therefore called compound; and the more of these clusters of fibres, or smaller vessels, enter into the composition of a larger one, the thicker and stronger it is.

A muscle is divided, by anatomists, into the body, and the two extremities: the body *c* (plate CLXXXIV. fig. 1.) is also called the venter or belly of the muscle; and the two extremities, if white, are called tendons; whereof that marked *a* is the right, and *b* the left. Fig. 3. *ibid.* represents a simple muscle opened, to shew the internal series of fleshy fibres: and fig. 4. exhibits a section of a regular compound muscle, shewing the arrangement of fibres in each belly.

That extremity where the muscle arises, is called its head, caput; or its beginning, origin, or fixed point: and its other extremity, or end, is called its tail, moveable point, and often its tendon; and, finally, if this be broad and membranous, it is called an aponeurosis.

In many of the muscles, both the extremities are moveable: in these, that part which of the two is least moveable, is always called the head, and the more moveable part the tail. This, however, cannot be done universally; since there are cases in which that extremity of a muscle, which was before the moveable point, becomes the fixed point; and *vice versa*, as in the serrati antici, and some of the muscles of the abdomen, not to mention any others.

Action of the MUSCLES. This consists in the contraction of its belly, after whatever manner that is done: by this means its extremities approach toward each other; and, by this means also, the part in which the end of the muscle is inserted, moves as if it were drawn by a cord. Schelhammer is of opinion, that this contraction of the belly of the muscle is effected by a corrugation of the fibres, in the same manner as we see an earthworm shorten and contract itself by corrugating



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rugating its ſkin, *&c.* Morgagni, on the other hand, alledges, that in order to underſtand the power of motion in a muſcle, we ought to attend to Wallis's experiment; by which it is evidently proved, that the ſmalleſt force imaginable of the air, driven through a cylindric tube into a bladder, will, by diſtending its width, and ſhortening its length, cauſe it to riſe up, and ſuſtain a weight of ſixty or ſeventy pounds.

Others have demonſtrated, from hydroſtatical principles, that a very ſmall quantity of a fluid, directed through a ſmall cylindric tube, placed in a veſſel of a larger baſe, and already filled, will be able, in the ſame manner, to move and raiſe up a large weight; from whence they conclude, that the belly of a muſcle ſwells in the time of its contraction or action; and that this intumeſcence may, nay and muſt, have very great effects.

On the other hand, there are, among the lateſt and moſt celebrated writers, ſome who affirm that the belly of a muſcle does not ſwell or become diſtended at all in the time of its contraction. But it would be well, ſays Heiſter, if the aſſerters of this opinion would, while they forcibly draw up the under jaw to the upper, lay two or three of their fingers upon either the temporal or maſſeter muſcle; for, in this caſe, they would ſee the moſt evident of all conviction, that, while theſe muſcles act, their bellies are in reality diſtended, and rendered firmer. Or let them only, when the hand is placed in a proper ſituation, forcibly draw the thumb towards the firſt finger, and then they may both ſee and feel, that the muſcle between the thumb and the index ſwells, or is diſtended in its middle, as the action of drawing the thumb is performed. The reader who would enter more deeply into this diſquiſition, may conſult Borelli de Motu animalium; Bernouilli de Motu muſcul. Berger's Phyſiolog. c. 22. Boerhaave's Inſtitutes, chap. of muſcular motion; and Mead's Introduction to Cowper's Myographia.

Among the muſcles, there are different ones that conſpire in the ſame action, and ſo perform the ſame motion as aſſociates: ſuch are the flexors or extenſors of the arm, and the like: hence theſe, and ſuch others as conſpire in the ſame manner to the ſame action, are called by authors ſocii and congeneres.

When, on the other hand, we regard the contrary actions of certain muſcles, as the extenſors of any part which act quite contrary to the flexors, theſe are called antagoniſt muſcles; in this caſe both the kinds acting together, render the limbs rigid or immoveable: this action of the muſcles is called motus tonicus. It is alſo obſervable, that ſeveral of the muſcles, conſidered ſingly and ſeparately, perform other kinds of motions beſides thoſe aſcribed to them in regard to the whole part: thus the maſtoide muſcle, the rectus major capitis, *&c.* when they act on both ſides, bend the head forwards; but when only on one ſide, they draw the head obliquely downwards, and to one ſide. Hence, from the diverſity of the muſcles, which act either alone or conjunctly with their aſſociates, or with others, there ariſe ſeveral intermediate motions, quite different from the primary ones, and ſuch as have not hitherto been ſufficiently obſerved. This does not only happen in regard to the muſcles of the head, the flexors and extenſors, and the like, but to ſeveral others; and particularly to thoſe of the eyes, the lips, the jaws, the tongue, the neck, the abdomen, the arm, the carpus, *&c.* Theſe we are carefully to attend to, and explain to ourſelves, by what particular muſcles, acting diſtinctly, they are performed; otherwiſe we ſhall never be able to underſtand the various and wonderful motions of the parts. Winſlow, in his excellent obſervations on the actions of the muſcles, publiſhed in the Memoirs of the Paris-Academy, obſerves, among other curious things, that a great many of the motions of the muſcular parts are not owing to the ſuppoſed contraction, but to the relaxation of the muſcles on the oppoſite ſide.

Inſertion and force of the MUSCLES. The all-wiſe author of nature has furniſhed animals with limbs, moveable about the joints by means of muſcular cords, inſerted near the joints or center of motion; the great wiſdom of which contrivance will appear, from ſuppoſing the inſertion to be at E (plate CLXXXV. fig. 2.) near the wriſt B, the muſcle D E being either looſe and ſeparate from the bones D A B, or bound down to it by ſome ligament or faſcia R; in either of which caſes the bone A B cannot be turned up quite to the ſituation A H, unleſs the muſcle D E be contracted or ſhortened to D M, which would not only be troubleſome but even impoſſible. It would be trouble-

troublefome becaufe the breadth and thicknefs of the arm would be vaftly increafed, fo as to become as big as the belly of an animal. On the other hand, the ftructure of a mufcle being fuch that it cannot be contracted but a little, feldom above two or there fingers breadth; fuch an infertion as that at E, which requires a contraction of above a foot and a half, would be altogether impoffible. Therefore, in fact, we find the mufcles inferted near the center of motion, as at I, *ibid.* fig. 3.

In order to calculate the force of any mufcle, we are to confider the bones as levers; and then the power or force of the mufcle will be always to the refiftance or weight it is capable of raifing, as the greater diftance of the weight from the center of motion is to the leffer diftance of the power. Hence, it being found by experiments, that a robuft young man is able to fufpend a weight R (*ibid.* fig. 3.) equal to twenty-eight pounds, when the arm is extended in a fupine and horizontal fituation, we have this proportion, *viz.* the force of the mufcle I D is to the weight R, = 28 ℔. as the diftance B C is to the diftance I C. But it is found, that B C, the length of the cubit and hand, is more than twenty times greater than I C, the diftance of the mufcle from the center of motion. Therefore the force of the mufcle I D, muft be more than twenty times greater than the weight R, or more than 28 × 20 = 560 ℔.

Again, to find the force which the biceps and brachiæus mufcles exert, when the humerus E A (*ibid.* fig. 4.) is perpendicular to the horizon, we are firft to confider what weight a man is capable of fuftaining in this pofture, *viz.* R = 35 ℔. and next the quantity of the diftances C B, C I, which in this cafe are as 16 to 1. Therefore the force of thefe mufcles is to the weight R = 35 ℔. as the diftance C = 16 is to the diftance of I C = 1; or the force is equal to 560, as before.

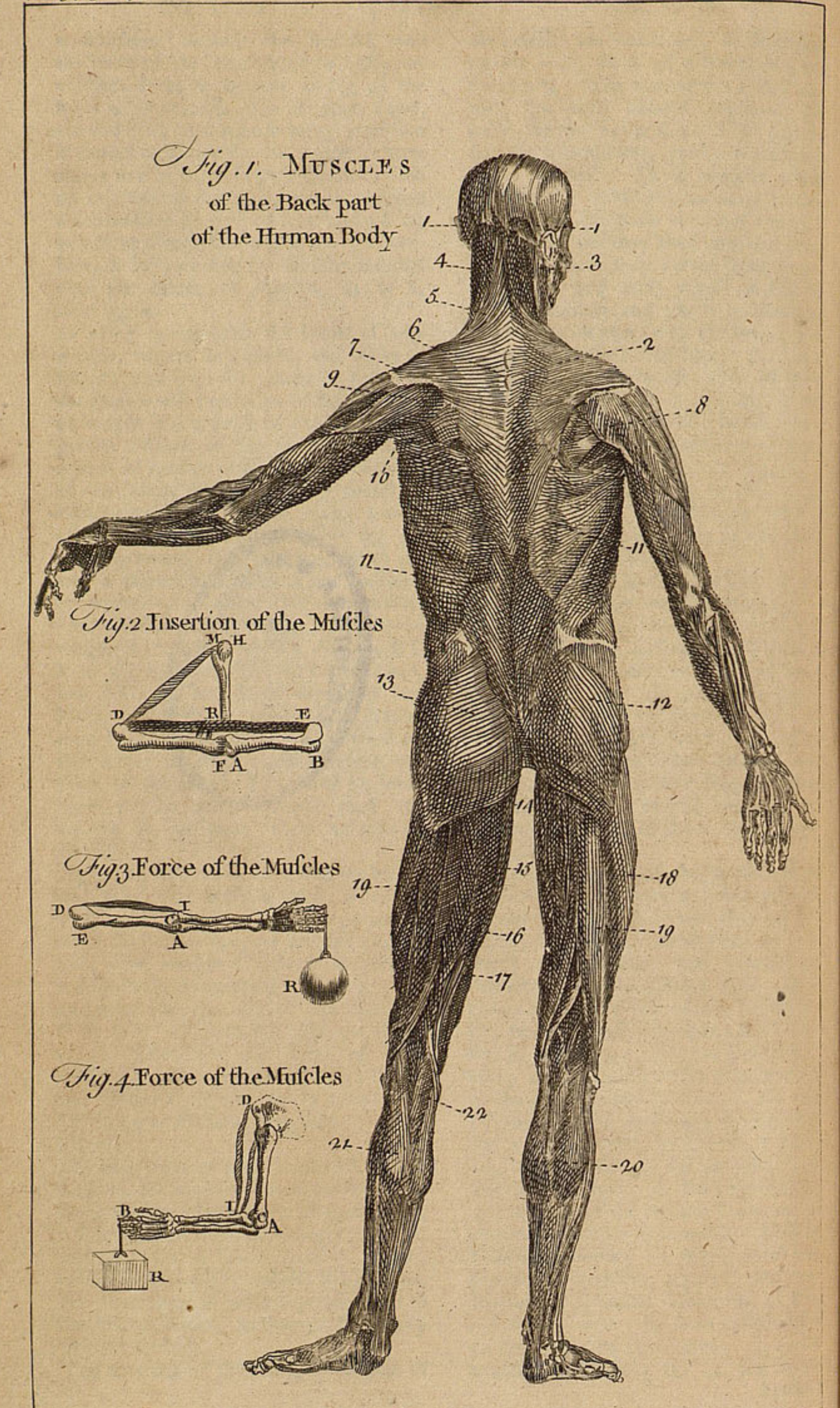
But what appears moft wonderful, is the force of the mufcles that move the lower jaw; which, when taken altogether, do not in a man exceed the weight of 1 ℔. and yet exert a force equal to 534 ℔. and in maffive dogs, wolves, bears, lions, *&c.* their force is vaftly fuperior, fo as to break large bones, as they practife daily in their feeding.

The motions of the far greater part of the mufcles are voluntary, or dependent on our will; thofe of a few others, involuntary. The former are called animal, the other natural motions. Finally, the motions of fome of the mufcles are of a mixed kind, partly animal and partly natural. Thofe mufcles which perform the voluntary motions receive nerves from the brain or fpinal marrow: thofe which perform their motions involuntarily, have their nerves from the cerebellum; and thofe whofe motion is partly voluntary and partly involuntary, have theirs in part from the brain, and in part from the cerebellum. And as a mufcle can no longer act when its nerve is either cut afunder or tied up, fo the fame abfolute dependence it has on its artery: for from the experiments of Steno and others on living animals, it appears, that on cutting or tying up the artery, the mufcle in the fame manner lofes its whole power of action, as if the nerve had been cut or tied up.

Names, number, and diftinction of the MUSCLES. The mufcles generally receive their names from their fixed and moveable points, conjointly; fometimes from the fixed point only; and fometimes, only from the moveable point: fome of them alfo are denominated from their ufes; and fome from their figure, or refemblance to other things: and, finally, fome from their fize, fituation, or other qualities, as will appear in our defcription of each of them under its proper article.

As to the number of the mufcles in the human body, authors are ftrangely difagreed about it: however, they are certainly, fays Heifter, more than five hundred; the principal ones whereof are reprefented in two plates; thofe confpicuous in the fore-part of the human body, being expreffed in plate CLXXXIV. fig. 1. where 1. 1. are the frontal mufcles; 2. 2. the orbiculares palpebrarum; 3. the attollens auriculam; 4. the temporalis; 5. the maffeter; 6. reprefents the mufcle called, by Lancifi, conftrictor, or depreffor pinnæ narium; 7. the dilatator alæ nafi; 8. the zygomaticus; 9. the place of the elevator labiorum, or elevator labiorum communis, called, by Lancifi, gracilis; 10. the elevator labii fuperioris proprius; 11. 11. the conftrictor, or fphincter labiorum, or orbicularis labiorum; by fome called ofculatorius; 12. the buccinator; 13. 13. the mufculi maftoidei; 14. 14. the fternohyoidei;


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hyoidei; 15. 15. thofe parts of thefe mufcles which arife from the clavicle; 16. 16. the coracohyoidei; 17. the fcaleni; 18. reprefents part of the cucullaris on the right fide; 18. on the left fide, is the levator, or elevator fcapulæ, otherwife called mufculus patientiæ; 19. 19. the place where the fibres of the pectoralis unite, in fome meafure, with thofe of the deltoides; 20. 20. the deltoides; 21. the place in the carpus, where the palmaris longus paffes through a ring in the annular ligament; 22. a remarkable union of the tendons of the extenfors of the three laft fing rs; 23. 23. the productions of the peritonæum, which, perforating the mufcles of the abdomen at the rings, defcend to the fcrotum; 24. 24. the place where the three tendons of the fartorius, gracilis, and feminervofus are inferted into the anterior and internal part of the tibia, juft under the knee; 25. 25. the tendons of the extenfors of the toes, which are fecured by a ligament at the ancle, as appears on both fides; but on the right fide, internally, another ligament is reprefented, which fixes the tendons of the extenfor longus digitorum, the tibiæus pofticus, and the flexor pollicis; 26. 26. the mufculus pectoralis; 27. the triceps extenfor cubiti on the right fide; 28 and 30. the biceps on the left fide, according to Lancifi's explication; 29. part of the triceps extenfor on the left fide; 30. the biceps on the right fide; 31. the brachiæus internus; 32. the anconæus; 33. the pronator rotundus; 34. 34. the fupinator longus; 35. 35. the radius externus, according to Lancifi; 36. the extenfor carpi ulnaris; 37. 37. the cubitæus internus, according to Lancifi; 38. the radius internus, according to Lancifi; 39. the palmaris with its tendinous expanfion; 40. 40. the tendons of the mufcles of the thumb; 41. the tendon of the adductor pollicis; 42. the extenfor magnus digitorum; 43. ligamentum carpi; 44. 44. the tendons of the iliaci interni; 45. the pectinæus; 46. one of the heads of the triceps; 47. 47. the rectus femoris on each fide; 48. 48. the vaftus externus on each fide; 49. 49. the vaftus internus on each fide; 50. the gracilis; 51. the feminervofus; 52. the fartorius on each fide; 53. a part of the origin of the vaftus externus; 54. 54. the membranofus; 55. the tibialis anticus; 56 the gemeli; 57. 57. the folæi; 58. the tendo achilis; 59. according to Lancifi, is the extenfor digitorum longus; 60. 60. the tendons of the extenfors of the toes; 61. the tendons of the extenfor longus, tibiæus pofticus, and flexor pollicis; A. A. portions of the latiffimus dorfi on each fide; B. B. the indentations of the ferratus major anticus; C. C. the fternum.

Plate CLXXXV. fig. 1. reprefents the mufcles of the back-part of the human body; where 1. 1. exprefs the two mufcles upon the occiput, called, by Euftachius, quadrati; 2. the mufculus cucullaris; 3. the fplenius; 4. the mufculus maftoideus; 5. the mufculus patientiæ, or levator fcapulæ proprius; 6. the rhomboides; 7. the articulation of the clavicle with the fcapula on the right fide; 8. the deltoides; 9. the teres minor; 10. the teres major; 11. 11. the latiffimus dorfi on each fide; 12. the glutæus major; 13. the glutæus medius; 14. the mufculus pyriformis; 15. the quadratus femoris; 16. the biceps femoris; 17. the femimembranofus; 18. the membranofus, according to Lancifi; 19. 19. the vafti externi; 20. the gaftrocnemii; 21. the foleus; 22. the plantaris.

Muscle, *mytulus*, in natural hiftory, a fhell compofed of two valves, of an oblong figure, and fhutting clofe all the way; the valves are both convex, and of a fimilar fhape: and the animal inhabiting it is called a tethys. See the article Tethys.

Of the numerous fpecies of mufcles, fome are of a conic figure; others oblong, and equal at both extremities, called by many tellinæ; fome are fmooth on the furface, others rough; and, finally, fome are much deeper than others.

To this genus belongs the pinna marina, or ovato-conic, great ftriated, and rugofe fea-mufcle: it is one of the largeft of the bivalve fhells, being frequently two feet long, and near one broad. The other fpecies of mufcles are numerous, and are called, by authors, pinnæ marinæ, mufculi, and tellinæ.

MUSCOVY-glass, in natural hiftory, the white fhining fpecularis with large and broad leaves, otherwife called ifinglafs. See the article Specularis.

MUSCULAR, or Musculous, in anatomy, fomething relating to, or partaking of the nature of a mufcle. See the article Muscle.

From the fubclavians, arife the mufcular arteries of the neck, which are uncertain both

both in their number and ſituation, and are diſtributed through the muſcles of the neck.

There are alſo muſcular veins of the neck, which are either ſuperior or inferior, ariſing alſo from the ſubclavian veins.

MUSEUM, a name which originally ſignified a part of the palace of Alexandria, which took up at leaſt one fourth of that city. This quarter was called the Muſeum, from its being ſet apart for the muſes and the ſtudy of the ſciences. Here were lodged and entertained the men of learning, who were divided into many companies or colleges, according to the ſciences of which they were the profeſſors; and to each of theſe houſes or colleges was allotted a handſome revenue. The foundation of this eſtabliſhment is attributed to Ptolemy Philadelphus, who here placed his library. Hence the word muſeum is now applied to any place ſet apart as a repoſitory for things that have an immediate relation to the arts.

The Muſeum at Oxford, called the aſhmolean Muſeum, is a noble pile of building, erected at the expence of the univerſity, at the weſt end of the theatre, at which ſide it has a magnificent portal, ſuſtained by pillars of the corinthian order. The front, which is to the ſtreet, extends about ſixty feet, where there is this inſcription over the entrance, in gilt characters, *Muſæum Aſhmoleanum, ſchola naturalis hiſtoriæ, officina chymica.* It was begun in 1679, and finiſhed in 1683, when a valuable collection of curioſities was preſented to the univerſity by Elias Aſhmole, eſq. which were the ſame day repoſited there. And ſeveral acceſſions have been ſince made to the muſeum; among which are hieroglyphics and other egyptian antiquities, an entire mummy, roman antiquities, altars, medals, lamps, &c. and a variety of natural curioſities.

The britiſh Muſeum in London is a large, beautiful and magnificent building, and the nobleſt cabinet of curioſities in the world. This edifice was erected in 1677, and was called Montague-houſe, from having been the town-reſidence of the dukes of Montague. In the year 1753, the britiſh parliament having paſſed an act for purchaſing the Muſeum of the late Sir Hans Sloane, and the collection of manuſcripts of the late lord Oxford, called the Harleian Library, for the uſe of the public; 26 truſtees were appointed and incorporated, to provide a repoſitory for theſe and ſome other collections, which repoſitory was to be called the Britiſh Muſeum. Theſe truſtees elected fifteen other truſtees, and having bought Montague-houſe, fitted it up for the reception of theſe collections; they alſo appointed officers to ſuperintend the Muſeum, and having ordained certain ſtatutes with reſpect to viewing the collection contained in it, the public were admitted to view it in 1757.

MUSES, certain fabulous divinities amongſt the pagans, ſuppoſed to preſide over the arts and ſciences: for this reaſon it is uſual for the poets, at the beginning of a poem, to invoke theſe goddeſſes to their aid. Some reckon the muſes to be no more than three, *viz.* Mneme, Aœde, and Melete; that is, memory, ſinging, and meditation: but the moſt antient authors, and particularly Homer and Heſiod, reckon nine; *viz.* Clio, which means glory; Euterpe, pleaſing; Thalia, flouriſhing; Melpomene, attracting; Terpſichore, rejoicing the heart; Erato, the amiable; Polyhymnia, a multitude of ſongs; Urania, the heavenly; and Calliope, ſweetneſs of voice. To Clio, they attributed the invention of hiſtory; to Melpomene, tragedy; to Thalia, comedy; to Euterpe, the uſe of the flute; to Terpſichore, the harp; and to Erato, the lyre and lute; to Calliope, heroic verſe; to Urania, aſtrology; and to Polyhymnia, rhetoric.

The muſes are painted young, handſome, and modeſt; agreeably dreſſed, and crowned with flowers. Their buſineſs was to celebrate the victories of the gods, and to inſpire and aſſiſt the poets: hence the cuſtom of invoking their aid at the beginning of a poem. It muſt not, however, be imagined, that the antient poets themſelves ever conſidered the deities thus invoked, as divine perſons from whom they expected any real help. Their addreſſes to the muſes are mere allegories, and manners of expreſſing themſelves poetically, as when they make gods of ſleep, of fame, of virtue; and other natural and moral things; under the name of muſe they prayed for the genius of poetry, and all the talents neceſſary for a happy execution of what they had undertaken.

MUSHROOM, *fungus*, in botany, a genus of imperfect plants, compoſed of a pedicle, crowned with a broad head, convex

convex and ſmooth at the top ; and hollow, foliated, lamellated, or fiſtulous on the under ſide.

Muſhrooms are by many ſuppoſed to be produced from the putrefaction of the dung in which they are found; but notwithſtanding this notion is pretty generally received among the unthinking part of mankind, yet, by the curious naturaliſts, they are eſteemed real plants; for they have a regular root, a ſtalk conſiſting of ſeveral arrangements of fibres, the interſtices of which are filled up with a parenchymatous ſubſtance, leading from the root to the head or umbel, the underſide of which is full of lamellæ or chives, every one of which is a regular pod or ſeed-veſſel. If theſe lamellæ are examined in their ſeveral ſtates, the ſeeds in them may be eaſily diſcovered, and are always found to be of a ſize and degree of maturity proportioned to the ſtate of the plant: they have each of them alſo a ſiliquaceous aperture lengthwiſe, the ſeeds lying in rows ready to fall through it. The plant is eaſily and regularly propagated through theſe, and may not only be raiſed from ſeed, but like many other plants, may be propagated by roots; the ſeveral filaments at the root producing tubercles, in the manner of the potatoe; from each of which there will ariſe new roots, and a new plant. Hence, like other vegetables, they are annually propagated by the gardeners near London for ſale. We ſhall therefore deſcribe the method of cultivating them; but as there are ſeveral unwholeſome ſorts, we ſhall firſt give a ſhort deſcription of the true eatable kinds. Theſe at firſt appear of a roundiſh form, like a button, the upper part of which, as alſo the ſtalk, is very white; but being opened, the under part is of a livid fleſh-colour; but the fleſhy part, when broken, is very white: when theſe are ſuffered to remain undiſturbed they will grow to a large ſize, and explicate themſelves almoſt to a flatneſs, and the red part underneath will change to a dark colour.

Mr. Miller directs the following method of cultivating them. If you have no beds of your own that produce them, you ſhould look abroad in rich paſtures, during the months of Auguſt and September, till you find them; and then opening the ground about their roots, you will often find the earth full of ſmall white knobs, which are the off-ſets from the muſhrooms: theſe ſhould be carefully gathered; and preſerved dry with the earth about them. The muſhroom-beds ſhould be made of dung in which there is good ſtore of litter. Theſe beds ſhould be made on dry ground, and the dung being laid upon the ſurface about a foot thick, two feet and a half broad, and of a length in proportion to the quantity of muſhrooms deſired, it ſhould be covered about four inches deep with ſtrong earth; upon this lay more dung, about ten inches thick; then another layer of earth; ſtill drawing in the ſides of the bed, ſo as to form it like the ridge of an houſe, which may be done by three layers of dung and as many of earth. When the bed is finiſhed it ſhould be covered with litter, to keep out the wet and prevent its drying; in this ſituation it may remain eight or ten days, by which time it will be of a proper degree of warmth; the litter ſhould then be taken off, the ſides of the bed ſmoothed, and a covering of light rich earth ſhould be laid over the bed; upon this the ſmall roots or off-ſets of the muſhrooms ſhould be put, placing them two or three inches aſunder; then gently cover them about half an inch thick with the ſame light earth; and again put on the covering of litter. The great ſkill in managing theſe beds, is that of keeping them in a proper temperature of moiſture. By this means muſhrooms may be produced all the year; and when the beds are deſtroyed, the ſurface which contains the duſt and roots of the muſhrooms, ſhould be laid by in a dry place for a freſh ſupply, till the proper time of uſing it.

MUSIC, is one of the ſeven ſciences, commonly called liberal, and comprehended alſo among the mathematical, as having for its object diſcrete quantity or number, but not conſidering it in the abſtract like arithmetic, but in relation to time and ſound, in order to make a delightful harmony: or, it is the art of diſpoſing and conducting ſounds conſidered as acute and grave; and proportioning them among themſelves, and ſeparating them by juſt intervals pleaſing to the ſenſe.

Mr. Malcolm defines it a ſcience that teaches how ſound, under certain meaſures of time and tune, may be produced; and ſo ordered and diſpoſed, as either in conſonance (*i. e.* joint ſounding) or ſucceſſion, or both, they may raiſe agreeable ſenſations.

From this definition, the fcience naturally divides into two general parts, *viz.* fpeculative and practical.

The firft is the knowledge of the materia mufica, or how to produce founds in fuch relations of time and tune as fhall be agreeable in confonance or fucceffion, or both. By which we do not mean the actual production of thefe founds by an inftrument or voice, but the knowledge of the various relations of tune and time, which are the principles out of which the pleafure fought is derived.

The fecond is how the principles are to be applied, or how founds in the relation they bear to mufic (as thofe are determined in the firft part) may be ordered, and varioufly put together in fucceffion and confonance, fo as to anfwer the end. And this is what we call the art of compofition, which is properly the practical part of mufic.

Some add a third branch, *viz.* the knowledge of inftruments; but as this depends altogether on the firft, and is only the application and expreffion of it, it cannot regularly come under the definition, and confequently is no part or divifion of the fcience.

The firft branch, which is the contemplative part, divides itfelf into two; the knowledge of the relations and meafures of time, and the doctrine of time itfelf.

The former is properly what the antients called harmonics, or the doctrine or harmony in founds, as containing an explication of the grounds, with the various meafures and degrees of the agreement of founds in refpect of their tune.

The latter part is what they called rhythmica, becaufe it treats of the numbers of founds or notes, with refpect to time; containing an explication of the meafures of long and fhort, quick and flow, in the fucceffion of founds.

The fecond part, which is the practical part, as naturally divides itfelf into two, anfwering to the parts of the firft.

That which anfwers to harmonics, the antients called melopœia, becaufe it contains the rules of making fongs, with refpect to tune and harmony of founds. Mr. Malcolm fays, we have no reafon to think the antients had any fuch thing as compofition in parts. That which anfwers to rhythmica, they called rhythmopoeia; containing rules for the application of numbers and tune.

We find a ftrange diverfity in antient writers, as to the nature, office, extent, divifion, &c. of mufic.

The name is fuppofed originally formed of *mufa*, mufe; the mufes being fuppofed to be the inventors thereof; Kercher, however, will have it take its name from an egyptian word, as fuppofing its reftauration after the flood to have begun there, by reafon of the reeds on the banks of the river Nile. Hefychius tells us, the Athenians gave the name of mufic to every art.

What in the proper and limited fenfe of the word is called mufic, has for its object motion, confidered as under certain regular meafures and proportions, by which it affects the fenfes in an agreeable manner. Now as motion belongs to bodies, and as found is the effect of motion, and cannot be without it, but all motion does not produce found; hence this laft branch of mufic became farther fubdivded.

Where motion is without found, or as it is only the object of fight, it was either called mufica orcheftria or faltatoria, which contains rules for the regular motions of the body in dancing; or mufica hypocritica, which refpects the motions and geftures of the pantomimes.

When the motion is only perceived by the ear, that is, when found is the object of mufic, there were three fpecies, *viz.* harmonics, which confider the difference and proportions, with refpect to acute and grave; rhythmica, which refpects the proportions of founds as to time, or the fwiftnefs or flownefs of their fucceffion; and metrica, which belongs properly to poets, and refpects the art of making verfes: thefe are the principles which Alypius allows of.

Ariftides, Quintilianus, Bacchius, and other antient writers, define mufic the knowledge of finging, and things belonging thereto; which they call the motions of the voice and body; as if finging itfelf confifted only in the different tone of the voice. The fame authors, confidering mufic in the largeft fenfe of the word, divide it into contemplative and active; the firft, fay they, is either natural or artificial. The natural is either arithmetical, becaufe it confiders the proportions of numbers; or phyfical, which examines the order of the things of nature.

The artificial they divide as above, into harmonics, rhythmica, and metrica.

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The active, which is the application of the artificial, is either enunciative, as in oratory; organical, or instrumental performance; odical, for the voice and singing of psalms; hypocritical, in the motions of the pantomimes; to which some add hydraulic, though in reality no more than a species of organical, in which water is used for the producing and modifying of sounds. The musical faculties, as they call them, are melopoeia, which gives rules for the tones of the voice or instrument, and rhythmopoeia, for motions; as also poësis, for making verses.

Music appears to have been one of the most antient arts, and of all others vocal music must undoubtedly have been the first kind; for man had not only the various tones of his own voice to make his observations on, before any other art or instrument was found out, but had the various strains of birds to give him occasion to improve his own voice, and the modulations of sounds it was capable of. Of the many antient writers who agree in this conjecture, we shall only mention Lucretius, who says,

At liquidas avium voces imitarier ore,
Ante fuit multo quam levia carmina cantu,
Concelebrare homines possent aurisque juvare.

The first invention of wind-instruments he ascribes to the observation of the winds blowing in hollow reeds.

We might here add another testimony of the antiquity of this art from the Holy Bible, which says, that Jubal the sixth from Adam was the father of such as handle the harp and organ.

As for the other kinds of instruments, there were so many occasions for cords and strings, that men could not be long in observing their various sounds, which might give rise to stringed instruments. And for pulsatile instruments, as drums, and cymbals, they might arise from the observation of the hollow noise of concave bodies.

Plutarch, in one place, ascribes the invention of music to the god Apollo, and in another to Amphion, son of Jupiter and Antiope: this last, however, is pretty generally allowed to be the first who brought music into Greece, and to have been the first inventor of the lyra. The time he lived is not agreed upon. To him succeeded Chiron, the demi-god; Demodocus, Hermes Trismegistus, Olympus, Orpheus, whom some make the first introducer of music into Greece, and the inventor of the lyra; Phenicius Terpander, who was cotemporary with Lycurgus, and set his laws to music, to whom some attribute the first institution of musical modes, and of the lyre; Thales and Thamyris, who is said to have been the first inventor of music without singing. These were eminent musicians before Homer's time. Others of later date were Lasus Hermionensis, Melnypides, Philoxenus, Timotheus, Phrynnis, Epigonius, Lysander, Simmicus, and Diodorus, who were all considerable improvers of music. Lasus is said to have been the first author who wrote on music; he lived in the time of Darius Hystaspes. Epigonius invented an instrument with forty strings, called epigonium: Simmicus also invented one with thirty-five strings, called simmicium: Diodorus improved the tibia, by adding new holes, and Timotheus the lyre, by adding a new string; for which he was fined by the Lacedemonians.

As the accounts we have of the inventors of musical instruments among the antients, are very obscure, so also are the accounts what those instruments were; we scarce know any thing of them besides their names.

The general division of instruments, is into the stringed instruments, wind-instruments, and those of the pulsatile kind. Of stringed instruments, we hear of the lyra or cythara, psaltery, trigon, sambucus, magade, barbiton, pectis, testudo, epigonium, simmicium, and pandoron, which were all struck with the fingers or plectra.

Of wind-instruments, we hear of the tibia, fistula, hydraulic and other organs, tubæ, cornua, and lituus.

Of the pulsatile instruments, we hear of the tympanum, cymbalum, crepitaculum, tintinabulum, crotalum and systrum.

Music has been in the highest esteem in all ages, and among all people; nor could authors express their opinions of it strongly enough, but by inculcating that it was in heaven, and was one of the principal entertainments of the gods, and the souls of the blessed.

The effects ascribed to it by the antients, are almost miraculous; by means hereof diseases have been cured, unchastity corrected, seditions quelled, passions raised and calmed, and even madness occasioned. Athenæus assures us, that antiently all

laws divine and civil, exhortations to virtue, the knowledge of divine and human things, lives and actions of illustrious perfons, were writ in verfe, and publicly fung by a chorus to the found of inftruments; which was found the moft effectual means to imprefs morality, and a right fenfe of duty on the mind.

Dr. Wallis has endeavoured to account for the furprifing effects afcribed to the antient mufic, and charges them principally on the novelty of the art, and the hyperboles of the antient writers; nor does he doubt but the modern mufic, *cæteris paribus*, would produce effects as confiderable as that of the antients: the truth is, we can match moft of the antient ftories in this kind, in the modern hiftories; if Timotheus could excite Alexander's fury with the phrygian found, and footh him into indolence with the lydian, a more modern mufician is faid to have driven Eric king of Denmark into fuch a rage, as to kill his beft fervants. Dr. Neweneit tells us of an Italian, who by varying his mufic from brifk to folemn, and fo *vice verfa*, could move the foul fo as to caufe diftraction and madnefs. And Dr. South has founded his poem, called Mufica Incantans, on an inftance he knew of the fame thing. Derham, in his PhyficoTheology, makes mention of many other things equally furprifing with the inftances above recited.

There is a great difpute among the learned, whether the antients or moderns beft underftood and practifed mufic; fome maintaining that the antient art of mufic, by which fuch wonderful effects were performed, is quite loft; and others, that the true fcience of harmony is now arrived to much greater perfection, than was known or practifed among the antients.

The antient mufical notes were very myfterious and perplexed. Boëtius and Gregory the great, firft put them into a more eafy and obvious method. It was in the year 1204, that Guido Aretine, a benedictine fryar of Auretium in Tufcany, firft introduced the ufe of the ftaff with five lines, on which with the fpaces he marked his notes, by fetting a point up and down upon them, to denote the rife and fall of the voice; tho' Kercher mentions this artifice to have been in ufe long before Guido's time. Another contrivance of Guido's was to apply the fix mufical fyllables, *ut, re, mi, fa, fol, la*, which he took out of St. John the baptift's hymn. Befides his notes of mufic, by which, according to Kercher, he diftinguifhed the tones or modes, and the feats of the femitones, he alfo invented the fcale, and feveral mufical inftruments, called poly-plectra, as fpinnets and harpficords.

The next confiderable improvement was in the year 1330, when Jean De Muris, doctor of Paris, invented the different figures of notes, which exprefs the times or length of every note, at leaft their relative proportions to one another, now called longs, breves, femi-breves, crotchets, quavers, femiquavers, and demi-femiquavers, which fee under their refpective articles.

Guido Aretine is alfo faid to be the firft who invented and brought fymphony or concert into mufic; but what progrefs he made, and what were his compofitions, we do not know. In fhort, we may venture to affirm from the whole of what we find wrote on this fubject, that mufic did not begin to arrive at any tolerable perfection, till towards the end of the laft century, when the great Purcel and Corelli obliged the world with their moft agreeable and harmonical compofitions; then it was that mufic began to advance a-pace, and receive various improvements from many other ingenious compofers and performers of feveral european nations, efpecially the Italians and Englifh, and now feems brought near its utmoft perfection; fince all the agreeable combinations of the various continuance, rifing, falling, and mixtures of tones, muft be contained within certain limits, whofe number may not be fo great as is generally imagined; and becaufe of the great number of perfons who have for more than thirty years laft paft, applied themfelves to this art; among whom the excellent Mr. Handel himfelf, defervedly named the prince of muficians, both for his compofition and performance upon the organ and harpficord, has abundantly and wonderfully performed his part.

MUSK, a dry, light, and friable fubftance, of a dark blackifh colour, tinged with purple; it is a kind of perfume of a very ftrong fcent, and only agreeable when in a very fmall quantity, or moderated by the mixture of fome other perfume. It is found in a kind of bag or tumour which grows under the belly of a wild beaft

beast called moschus. See MOSCHUS. Musk is brought to us sewed up in a kind of bladders or cases of skin of the bigness of a pigeon's egg, or larger, each containing from two or three drams to an ounce of musk. These are covered with a brownish hair, and are the real capsules in which the musk is lodged while on the animal. That which is unadulterated appears in masses, of loose and friable granules, which are soft to the touch, and easily crumble between the fingers, feeling somewhat smooth and unctuous.

Musk taken inwardly produces ease from pain, quiet sleep, and a copious diaphoresis: hence it has been found of great use in spasmodic disorders, petechial, malignant, putrid fevers, the jail-distemper, hiccoughs, &c. and Dr. Wall observes, that it has been found useful in spasmodic disorders, given by way of clyster. The operation of musk in some respects resembles that of opium; but it does not leave behind it any stupor or languidness, which the latter often does. Musk likewise seems likely to answer in those low cases where sleep is much wanted, and opiates are improper. It is said to be best given in a bolus, in which form those who are most averse to perfumes, may take it without inconvenience. Fifteen grains or more are now given in a dose with great success.

MUSK-HOG, *Tajacu*. See TAJACU.

MUSK-ANIMAL, *Moschus*. See the article MOSCHUS.

MUSK-*seed*, in botany, the English name of that species of hibiscus, called by botanists the abelmosch. See HIBISCUS.

MUSK-JULEP. See the article JULEP.

MUSKET, a fire-arm borne on the shoulder, and used in war. The length of a musket is fixed at three feet eight inches from the muzzle to the pan, and it carries a ball of sixteen to the pound.

In fortification, the length of the line of defence is limited by the ordinary distance of a musket-shot, which is about 120 fathoms; and the length of almost all military architecture is regulated by this rule.

Muskets, besides the ordinary duty on iron, pay on importation 1 s. $11\frac{10}{100}$d. each; and draw back, on exportation, 1 s. $8\frac{25}{100}$d. but they are not to be imported without licence.

MUSKET-BASKETS, in fortification. See the article BASKETS *of earth*.

MUSKETOON, a kind of short thick musket, whose bore is the thirty-eighth part of its length: it carries five ounces of iron, or seven and a half of lead, with an equal quantity of powder. This is the shortest sort of blunderbusses. See the article BLUNDERBUSS.

MUSLIN, a fine thin sort of cotton-cloth, which bears a downy knap on its surface. There are several sorts of muslins brought from the East-Indies, and more particularly from Bengal; such as doreas, betelles, mulmuls, tanjeebs, &c.

Muslins, on their importation, pay a duty of 2 s. $10\frac{20}{100}$d. the piece, which is drawn back on exportation; and besides this, a duty of 15 l. *per cent.* to be computed according to the gross price at which they are publicly sold by auction: but if they are exported, all drawn back is for 20 s. value.

MUSSÆNDA, in botany, a genus of the pentandria monogynia class of plants, the corolla of which consists of a funnel-shaped petal; the fruit is oval, oblong, succulent, and coronated; and the seeds are numerous, and arranged into four series.

MUSSELBOROUGH, a port-town of Scotland, in the shire of Lothian, six miles east of Edinburgh.

MUSTARD, *sinapi*, in botany. See the article SINAPI.

MUSTELA, in zoology, a genus of quadrupeds of the order of the feræ, the upper foreteeth of which are straight, distinct, and acute; the foreteeth of the lower jaw are obtuse and clustered, two of them stand inward; the feet are made for climbing.

This genus comprehends the gulo, the martin, the pole-cat, the weasel, the ferret, the ermin, the sable, the genet, the tabbied mungo, and the brown mungo. See the article GULO, &c.

MUSTELA, or the FOSSIL MUSTELA, in ichthyology, is also the name of the blue cobitis, with five longitudinal black lines on each side. See the article COBITIS.

This is a species very singular in its manner of living, as well as in its figure; it is five inches long, and somewhat more than half an inch in diameter; the head is short, broad, and obtuse; the belly is smooth, and of a bluish colour, with ten longitudinal lines running down it, five on each side of the back; about the mouth is placed a number of whitish

slender

ſlender cirri or beards; the pectoral fins have each eleven rays, the ventral ones five, the dorſal and the pinna ani ſeven. Where the ſhores are ſandy, it will work its way under the ſand to a great diſtance from the water, and is there dug up.

MUSTAGEN, a port-town of Barbary, in the kingdom of Algiers, 140 miles weſt of the city of Algiers.

MUTE, *dumb*, in a general ſenſe, ſignifies a perſon that cannot ſpeak, or has not the uſe of ſpeech.

MUTE, in law, a perſon that ſtands dumb or ſpeechleſs, when he ought to anſwer, or to plead. A priſoner, by our law, is ſaid to ſtand mute ſeveral ways, *viz.* 1. When he does not ſpeak at all, in which caſe it ſhall be inquired whether he ſtands mute out of obſtinacy, or by the act of God. 2. When the priſoner does not plead directly, or will not put himſelf on the inqueſt to be tried; or where he feigns himſelf mad, and refuſes to anſwer upon his trial. 3. A priſoner ſhall be taken as one that ſtands mute, when on his trial he peremptorily challenges above the number of jurors allowed by law. In the crime of high treaſon, if the priſoner ſtands mute, he ſhall forfeit lands and goods in the ſame manner as if he had been attainted. Alſo in felony and petit treaſon, a perſon that ſtands mute ſhall forfeit his lands and goods as on other attainders, though whenever a perſon ſtanding mute is adjudged to his penance for felony, it is held he thereby prevents the attainder which otherwiſe might be incurred, and forfeits only his chattels.

MUTE, in grammar, a letter which yields no ſound without the addition of a vowel. The ſimple conſonants are ordinarily diſtinguiſhed into mutes and liquids, or ſemi-vowels. See the articles CONSONANT, LIQUID, &c.

The mutes in the greek alphabet are nine, three of which, *viz.* π, κ, τ, are termed tenues; three, β, γ, δ, termed mediæ; and three, φ, χ, θ, termed aſpirates. See the article ASPIRATE, &c.

The mutes of the latin alphabet are alſo nine, *viz.* B, C, D, G, I, K, P, Q, T.

MUTILATION, the retrenching or cutting away any member of the body.

This word is alſo extended to ſtatues and buildings, where any part is wanting, or the projecture of any member, as a corniche or an impoſt is broken off. It is ſometimes alſo uſed, in a more immediate manner, for caſtration. See the article CASTRATION.

MUTUAL, a relative term, denoting ſomething that is reciprocal between two or more perſons: thus we ſay, mutual aſſiſtance, mutual promiſe, mutual love, &c.

MUTULE, in architecture, a kind of ſquare modillion ſet under the corniche of the doric order. See DORIC.

The only difference between the mutule and modillion conſiſts in this, that the former is uſed in ſpeaking of the doric order, and the latter in the corinthian. See CORINTHIAN and MODILLION.

MUTUUM, in the civil law, denotes a loan ſimply ſo called; or a contract introduced by the law of nations, whereby a thing conſiſting in weight, as bullion; in number, as money; or in meaſure, as corn, timber, wine, &c. is given to another upon condition that he ſhall return another thing of the ſame quantity, nature, and value, on demand. This therefore is a contract without reward, ſo that where uſe or intereſt ariſes, there muſt be ſome particular article in the contract whereon it is founded.

MUXARA, a port-town of Spain, in the province of Granada, ſituated on the Mediterranean, fifty miles ſouth-weſt of Carthagena.

MUYDEN, a town of Holland, ſituated on the ſouth coaſt of the Zuider ſea, ſeven miles eaſt of Amſterdam.

MUZZLE *of a gun or mortar*, the extremity at which the powder and ball is put in; and hence, the muzzle-ring is the metalline circle, or moulding, that ſurrounds the mouth of the piece. See the article GUN.

MYAGRUM, in botany, a genus of the tetradynamia ſiliculoſa claſs of plants, the corolla whereof conſiſts of four plane, roundiſh, obtuſe petals, diſpoſed croſswiſe, and narrower than the ungues. The fruit is a bivalve turbinato-cordated ſmall pod, lightly compreſſed and rigid, with the apex ending in a conical rigid ſtyle; the ſeeds are roundiſh.

MYCONE, one of the iſlands of the Archipelago, about twenty-five miles in circumference, ſituated in eaſt long. 25° 6′, north lat. 37°.

MYLOGLOSSUM, in anatomy, is, according to Heiſter, no more than a part of the mylohyoides, though other anatomiſts make it a diſtinct pair of muſcles, thus called becauſe it ariſes about the backſide of the molares, and is inſerted

into

into the ligament of the tongue, helping to pull it upwards; being the same with what Cowper calls styloglossum. See the next article.

MYLOHYOIDÆUS, in anatomy, one of the five pair of muscles belonging to the os hyoides. The mylohyoidæus arises with a large base from the bottom of the lower jaw, near the chin, and terminates at the base of the os hyoides. See the article HYOIDES.

Besides the common use ascribed to this muscle, which is to move the hyoides, the tongue, and the larynx, both upwards, inwards, and sideways, its series of transverse fibres have a farther use, when it is at rest; and that is to compress the glands under the tongue, and by this means promote the discharge of the saliva into the mouth from the lower salival ducts: whence it is we use this muscle, when we want saliva in the mouth.

MYLON, in surgery, a large kind of staphyloma. See the article STAPHYLOMA.

MYOLOGY, μυολογια, that part of anatomy which treats of the muscles of the human body. See the article MUSCLE.

MYOMANCY, a kind of divination by means of mice. See DIVINATION.

MYOPIA, or MYOPIAS, short-sightedness, a species of vision, wherein objects are seen distinctly only at small distances; which is incident to persons who have the cornea and crystalline, or either of them, too convex.

From this configuration of the eye it is plain, that the distinct picture of objects at an ordinary distance will fall before the retina; whence the vision must be confused and indistinct. In order therefore to see distinctly, they are obliged to bring the objects very nigh to the eyes; by which means the rays being more diverging, are made to converge and meet at the retina; where a distinct picture being formed, the object will be seen distinctly.

They that are short-sighted never look attentively at those who speak to them, as being unable to observe the motion of their eyes, which contributes greatly to explain and enforce their words; and therefore, they are only attentive to the discourse. Short-sighted persons need less light than others, to see distinctly; whence they can read the smallest print, when others are not able to distinguish one letter from another.

Myopes, or short-sighted persons, have their sight mended by a concave lens, of a due degree of concavity: for the refraction of the rays of light being in such persons too strong, in proportion to the distance of the retina from the crystalline, this refraction will be diminished by the interposition of such a glass, whereby the objects will be seen distinctly: but as such glasses represent objects under a less angle, they must appear less than to the naked eye.

Short-sighted persons usually become less so, as they advance in years; and that because the humours of the eye wasting, the cornea shrinks and becomes less convex, and the crystalline becomes flatter than before; by which means objects are seen more distinctly, and at greater distances, than when the refraction was stronger in the more plump and convex eyes. See the article VISION.

MYOSOTIS, MOUSE-EAR, in botany, a genus of the pentandria-monogynia class of plants, with a monopetalous flower, semiquinquifid at the limb: the seeds are four, which are contained in the bottom of the cup.

MYOSURUS, MOUSE-TAIL, in botany, a genus of the pentandria-polygynia class of plants, the flower of which consists of five very small petals; and its numerous seeds are disposed in an imbricated order upon a receptacle.

MYRIAD, a term sometimes used to denote ten thousand.

MYRICA, in botany, a genus of the diœcia-tetrandria class of plants, without any flower petals: the cup is a squama of a lunated figure; and the fruit is a berry, containing only a single seed.

MYRIOPHYLLUM, SMALL WATER-MILFOIL, in botany, a genus of the monoecia-polyandria class of plants, without any flower petals; and the fruit is composed of four naked seeds.

MYRISTICA, the NUTMEG-TREE, a genus of trees, the characters of which are not fully ascertained: it is said to have no flower petals; and its fruit is a drupe, of a roundish figure, containing a single seed, lightly sulcated. See NUTMEG.

MYRMECIA, or FORMICA, a painful kind of wart, with a broad base, and deeply rooted; growing on the palms of the hands, and soles of the feet; for the extirpation of which, see the articles WART and EXCRESCENCE.

MYRMECOPHAGA, the ANT BEAR, in zoology, a genus of quadrupeds, of the order of the agriæ, the body of which is

is covered with hair, and the ears roundish. There are three species of it; the one, called the great ant-bear, with three toes on the fore-feet, and five on the hinder; another, or lesser ant-bear, with four toes on the fore-feet, and five on the hinder; and a third, with only two toes on the fore-feet, and four on the hinder.

They are so called from feeding on ants, which it does by thrusting out its tongue upon an ant-hill, and drawing it into the mouth when covered with these creatures.

MYRMILLONES, in roman antiquity, a kind of gladiators, so called from their wearing the myrmillo, a sort of gallic armour.

MYROBALANS, a kind of medicinal fruit brought from the Indies, of which there are five kinds: 1. the citrine, of a yellowish-red, hard, oblong, and the size of an olive: 2. the black, or indian myrobalan, of the bigness of an acorn, wrinkled, and without a stone: 3. chebulic myrobalans, which are of the size of a date, pointed at the end, and of a yellowish-brown: 4. emblic, which are round, rough, the size of a gall, and a dark-brown: and, 5. belleric, which are hard, round, of the size of an ordinary prune, less angular than the rest, and yellow. Each of these kinds are slightly purgative and astringent; but Quincy observes, that the best of them are not worth regarding, since they rather clog than assist any composition.

MYRRH, a vegetable production of the gum or resin-kind, issuing by incision, and sometimes spontaneously, from the trunk and larger branches of a tree growing in Egypt, Arabia, and Abyssinia. The incisions are made twice a-year, and the myrrh ousing out, is received on rush-mats dispersed underneath.

Myrrh is sent over to us in loose granules of various sizes, from that of a pepper-corn, to the bigness of a walnut. The generality of them, however, are from the size of a pea, to a little more than that of a horse-bean: these are sometimes roundish, but often irregularly long and contorted. The colour of myrrh is a reddish-brown, with more or less of an admixture of yellow, and in the purest pieces it is somewhat transparent. Its taste is bitter and acrid, with a peculiar aromatic flavour, but very nauseous: but its smell, tho' strong, is not disagreeable. It is to be chosen in clear pieces, light, friable, and of the bitterest taste.

Myrrh is of great use in medicine; it powerfully resolves and attenuates thick and viscid blood, and concreted bile, and glutinous humours, and is good in obstructions of the menses, and in infarctions of the viscera. It also promotes delivery and the expulsion of the secundines, and is good in asthmas, and in cases of tubercles of the lungs: it is of great service in the jaundice and in cachectic complaints: it destroys worms, strengthens the stomach, and dissipates flatulencies. Externally applied, it is discutient and vulnerary; it cleanses old ulcers, and disposes them to heal; but it gives many people the head-ach: and as it promotes discharges of blood, should never be given to persons subject to such discharges, as spitting of blood, or the like, or to women in the time of their pregnancy. It is administered either in pills, boluses, or tinctures; it not conveniently agreeing with any other forms.

MYRSINE, in botany, a genus of the pentandria-monogynia class of plants, the flower of which consists of a single petal, divided into five semi-oval, obtuse, and connivent petals: the fruit is a roundish depressed berry, containing five cells, with a single seed in each.

MYRTIFORM, in anatomy, an appellation given to several parts, from their resembling myrtle berries: thus we meet with the myrtiform caruncles, and the myrtiform muscle of the nose, which arises near the incisorius of the upper lip, and is inserted into the alæ of the nose. See the article CARUNCLE.

MYRTLE, *myrtus*, in botany, a genus of the icosandria-monogynia class of plants; the corolla of which consists of five large, oval, and undivided petals; and its fruit is an oval, trilocular berry, with a single kidney-shaped seed in each cell.

Myrtle-berries, says Quincy, are very rough and astringent, not much prescribed in composition for inward use; but they enter several of the strengthening-plasters: the syrup of them is esteemed good against abortion, and in fluxes of all kinds.

MYRTUS, the *myrtle*, in botany. See the article MYRTLE.

MYSIA, the antient name of a province in Asia, being the north-west part of Natolia, or Asia Minor.

MYSTERY, something secret or concealed, impossible or difficult to comprehend. All religions, true or false, have their mys-

myſteries. The pagan religion was remarkably full of them. Ovid reckons it a great crime to divulge the myſtic rites of Ceres and Juno. The eleuſinia, or ſacred rites of Ceres, ſolemnized at Eleuſis, were called, by way of eminence, the myſteries; and ſo ſuperſtitiouſly careful were they to conceal theſe ſacred rites, that if any perſon divulged any part of them, he was thought to have called down ſome divine judgment on his head, and it was accounted unſafe to abide under the ſame roof with him; and Horace declares, that he would not put to ſea in the ſame ſhip with one who revealed the myſteries of Ceres. The pagan myſteries, it is true, were generally myſteries of iniquity, and concealed only becauſe their being publiſhed would have rendered their religion ridiculous and odious. Thus the ſacred writings often ſpeak of the infamous myſteries of the pagan deities, in which the moſt ſhameful crimes were committed under the ſpecious veil of religion.

The whole religion of the Egyptians was myſterious from the beginning to the end, and both their doctrines and worſhip wrapped up in ſymbols and hieroglyphics.

The religion of the Jews is ſuppoſed to be full of myſteries. The whole nation, according to St. Auguſtin, was a myſtery, as it repreſented or was a type of the people of Chriſt, and the chriſtian religion. Whatever was commanded or forbidden them was figurative, and their ſacrifices, prieſthood, *&c.* included myſteries. The prophecies concerning Jeſus Chriſt in the jewiſh books, are likewiſe figurative and myſterious.

The chriſtian religion has alſo its myſteries: but in the ſcripture language the word myſtery is uſed with ſome latitude, and denotes whatever is not to be known without a divine revelation, and all the ſecret things which God has diſcovered by his miniſters the prophets, by Jeſus Chriſt and his apoſtles. The myſteries of the chriſtian church are, the incarnation of the Word, the hypoſtatical union of the divine and human nature, the miraculous birth, death, and reſurrection of the ſon of God, the doctrine of the trinity, *&c.* See the article INCARNATION, *&c.*

St. Paul often ſpeaks of the myſteries of the chriſtian religion; as the myſtery of the goſpel, the myſtery of the croſs of Chriſt, the myſtery which was kept ſecret ſince the world began: and he calls the preachers of the goſpel, the ſtewards of the myſteries of God.

MYSTICAL, ſomething myſterious or allegorical. Some of the commentators on the ſacred writings, beſides a literal, find alſo a myſtical meaning. The ſenſe of ſcripture, ſay they, is either that immediately ſignified by the words and expreſſions in the common uſe of language; or it is mediate, ſublime, typical, and myſtical. The literal ſenſe they again divide into proper literal, which is contained in the words taken ſimply and properly; and metaphorical literal, where the words are to be taken in a figurative and metaphorical ſenſe. The myſtical ſenſe of ſcripture they divide into three kinds: the firſt correſponding to faith, and called allegorical; the ſecond to hope, called anagogical; and the third to charity, called the tropological ſenſe. And ſometimes they take the ſame word in ſcripture in all the four ſenſes: thus the word Jeruſalem, literally ſignifies the capital of Judæa; allegorically, the church militant; tropologically, a believer; and anagogically, heaven. So that paſſage in Geneſis, *let there be light, and there was light*, literally ſignifies corporeal light; by an allegory, the Meſſiah; in the tropological ſenſe, grace; and anagogically, beatitude, or the light of glory. See the article ANAGOGICAL, *&c.*

MYSTICS, a religious ſect diſtinguiſhed by their profeſſing a pure, ſublime, and perfect devotion, with an intire diſintereſted love of God, free from all ſelfiſh conſiderations, and by their aſpiring to a ſtate of paſſive contemplation.

MYTHOLOGY, μυθολογια, the hiſtory of the fabulous gods and heroes of antiquity, with the explanations of the myſteries or allegories couched therein. Lord Bacon thinks that a great deal of concealed inſtruction and allegory was originally intended in moſt part of the antient mythology: he obſerves, that ſome fables diſcovers a great and evident ſimilitude, relation, and connection with the thing they ſignify, as well in the ſtructure of the fable, as in the meaning of the names, whereby the perſons or actors are characterized.

The ſame writer thinks it may paſs for a farther indication of a concealed and ſecret meaning, that ſome of theſe fables are ſo abſurd and idle in their narration, as to ſhew an allegory even afar off: but the argument of moſt weight upon this

this subject he takes to be this, that many of these fables appear by no means to have been invented by the persons who relate them: he looks on them not as the product of the age, nor invention of the poets, but as sacred relics, as he terms them, gentle whispers, and the breath of better times, that from the tradition of more antient nations, came at length into the flutes and trumpets of the Greeks. He concludes, that the knowlege of the early ages was either great or happy: great if they by design made this use of trope and figure; or happy, if, whilst they had other views, they afforded matter and occasion to such noble contemplations.

MYTULUS, the *muscle*, in natural history. See the article MUSCLE.

MYURUS, in medicine, an epithet for a sort of sinking pulse, when the second stroke is less than the first; the third than the second, and so on. Of this, there are two kinds; the first, when the pulse sinks so as never to arise; the other, when it returns again, and rises in some degree. Both are esteemed a bad presage.

N.

N or n, the thirteenth letter, and tenth consonant of our alphabet: it is a liquid, the sound of which is formed by forcing the voice strongly through the mouth and nostrils; being at the same time intercepted by applying the tip of the tongue to the forepart of the palate, with the lips open. It suffers no consonant immediately after it, in the beginning of words and syllables; nor any before it, except *g*, *k*, and *s*; as in *gnaw*, *know*, *snow*, &c. As a numeral, N stands for 900; and with a dash over it, thus $\overline{N}$, for 900,000. N, or N°, stands for numero, *i. e.* in number; and N. B. for nota bene, note well, or observe well.

Among the antient Romans, N denotes Nepos, Nonnius, *&c.* N. C. Nero Cæsar, or Nero Claudius; N. L. Non Liquet; N. P. Notarius Publicus; and N B L. stands for nobilis.

NAAM, in law, the detaching or destraining a person's moveable goods; as where a man takes another man's beast for doing damage in his ground; or where it is done in consequence of another man's act, as when it is agreed, that in default of payment of some contract, it shall be lawful to distrain on lands charged therewith.

NAB, a river which rises in Franconia, and running through Bavaria, falls into the Danube above Ratisbon.

NABOB, a viceroy, or governor of one of the provinces of the Mogul's empire, in India. See the article INDIA.

NABONASSAR, or *Æra of* NABONASSAR, a method of computing time from the commencement of Nabonassar's reign. See the article EPOCHA.

The epocha of Nabonassar is of the greater importance, as Ptolemy and other astronomers account their years from it.

NABURG, a town of Germany in the palatinate of Bavaria: east long. 12° 7′, north lat. 49° 22′.

NADAB, the sovereign pontiff, or high-priest of the Persians, whose dignity is the same as that of the mufti among the Turks; with this difference only, that the nadab may divest himself of his ecclesiastical office, and pass to civil employments, which the mufti is not allowed to do. See the article MUFTI.

The nadab takes place next after the atmath-dulet, or prime minister; he has two judges under him, called the sceik and the casi, who decide all religious matters, grant divorces, and are present at contracts and public acts, and these have deputies in all the cities of the kingdom.

NADIR, in astronomy, that point of the heavens which is diametrically opposite to the zenith, or point directly over our heads.

The zenith and nadir are the two poles of the horizon. See HORIZON and POLE.

Sun's NADIR, in astronomy, is the axis of the cone formed by the earth's shadow: it is thus called, because being produced, it gives a point in the ecliptic

tic diametrically oppofite to the fun.

NAERDEN, a town of Holland, fituated at the fouth-end of the Zuyder-Sea, thirteen miles eaft of Amfterdam.

NÆVI, in furgery, marks or excrefcences made on the fkin of an infant before its birth, by the imagination of the mother. See the article IMAGINATION.

For the treatment of thefe, fee the article EXCRESCENCE.

NAHUM, or *the prophecy of* NAHUM, a canonical book of the Old Teftament.

Nahum, the feventh of the twelve leffer prophets, was a native of Elkofhai, a little village of Gallilee. The fubject of his prophecy is the deftruction of Nineveh, which he defcribes in the moft lively and pathetic manner; his ftyle is bold and figurative, and can hardly be exceeded by the moft perfect mafters of oratory. This prophecy was verified at the fiege of that city by Aftyages, in the year of the world 3378, 622 years before Chrift.

The time of Nahum's death is unknown: the greek menologies, and the latin martyrologies, place his feftival on the firft of December.

NAIADS, in mythology, the nymphs of the fountains. See the article NYMPH.

NAIANT, in heraldry, a term ufed in blazoning fifhes, when borne in an horizontal pofture, as if fwimming.

NAJARA, a town of Spain, fifty miles fouth of Bilboa.

NAJAS, in botany, a genus of the monoecia-monandria clafs of plants, the male corolla of which is monopetalous, and divided into four fegments at the limb: the femal one has no flower-petals; and the fruit is an oval capfule, containing ovato-oblong feeds.

NAIL, *unguis*, in anatomy, a kind of bony excrefcence growing on the fingers and toes of men, and feveral other animals. The number, figure, fize, and colour of the nails need no explanation. The feveral parts of the nails have their feveral names: the extremity is called the apex; the oppofite part of this is the root or bafe: near which there is a white part called the lunula, from its figure fomewhat refembling a fegment of a circle.

As to the fubftance of the nails, they are compofed of the cutaneous papillæ, elongated and indurated, and firmly connected to one another in a longitudinal direction: for this reafon, they are very fenfible at the roots, where thefe papillæ are yet tender; but at the apex, where they are perfectly indurated, they may be cut without pain.

The papillæ, of which the nails are formed, arife out of the fkin, not only at the root of the nail, but all over the greater part of its under furface. It is by this means that the nails are fo firmly connected to the fkin; and it is owing to the continual acceffion of more and more papillæ, as they approach towards the apex, that they become harder and firmer in that part. They may eafily be feparated intire, from dead fubjects by hot water.

We are next to enquire into the manner of their nutrition. As the reft of the papillæ of the cutis have their veffels, by which they are nourifhed; fo alfo the papillæ which form the nails, have their veffels for conveying nourifhment to them at the bafe: but as thefe papillæ do not, in their own form, conftitute the body of the nail, but become indurated as they are elongated, and feem only the roots or bafes of hard and rigid fibres; fo thefe indurated parts of them have fewer than the more tender; but yet enough for their nutrition are continued along them. Their growth is by means of thefe, and it continues as long as the perfon lives. It has been faid, that they grow after the perfon is dead; but Heifter thinks this an error.

The ufes of the nails are, 1. To ftrengthen and defend the extremities of the fingers and toes, that they may not be fo eafily hurt by external accidents as they otherwife would have been. 2. To affift the fingers in the more readily laying hold of little things, and in holding them the more firmly. 3. To be of ufe in cleaning the fkin from any accidental foulneffes on its furface. 4. On the toes, they ferve to make us tread the firmer, and to prevent the painful collifion their ends would otherwife be almoft continually fubject to.

Among the various animals, the claws, which are perfectly analogous to our nails, ferve them for feizing and tearing their prey, and for climbing trees: the fquirrels, *&c.* make the latter ufe of them; the beafts of prey, in general, the former. Among the other animals, the hoofs of fome ferve them as fhoes to walk on; in others, they anfwer both this purpofe and that of offenfive weapons, as in the horfe, to ftrike with.

NAILS, in building, *&c.* fmall fpikes of

 iron,

iron, brafs, *&c.* which being drove into wood, ferve to bind feveral pieces together, or to faften fomething upon them. The feveral forts of nails are very numerous; as 1. back and bottom nails; which are made with flat fhanks to hold faft, and not open the wood. 2. Clamp-nails, for faftening the clamps in buildings, *&c.* 3. Clafp-nails; whofe heads clafping and fticking into the wood, render the work fmooth, fo as to admit a plane over it. 4. Clench-nails, ufed by boat and barge-builders, and proper for any boarded buildings that are to be taken down; becaufe they will drive without fplitting the wood, and draw without breaking; of thefe there are many forts. 5. Clout nails, ufed for nailing on clouts to axle-trees. 6. Deck-nails, for faftening of decks in fhips, doubling of fhipping, and floors laid with planks. 7. Dog nails, for faftening hinges on doors, *&c.* 8. Flat-points, much ufed in fhipping, and are proper where there is occafion to draw and hold faft, and no conveniency of clenching. 9. Jobent-nails, for nailing thin plates of iron to wood, as fmall hinges on cupboard-doors, *&c.* 10. Lead-nails, for nailing lead, leather, and canvas to hard wood. 11. Port nails, for nailing hinges to the ports of fhips. 12. Pound-nails, which are four-fquare, and are much ufed in Effex, Norfolk, and Suffolk, and fcarce any where elfe, except for pailing. 13. Ribbing-nails, principally ufed in fhip-building, for faftening the ribs of fhips in their places. 14. Rofe-nails, which are drawn four fquare in the fhank, and commonly in a round tool, as all common two-penny nails are; in fome countries all the larger fort of nails are made of this fhape. 15. Rother-nails, which have a full head, and are chiefly ufed in faftening rother-irons to fhips. 16. Round head nails, for faftening on hinges, or for any other ufe where a neat head is required; thefe are of feveral forts. 17. Scupper-nails, which have a broad head, and are ufed for faftening leather and canvas to wood. 18. Sharp-nails; thefe have fharp points and flat-fhanks, and are much ufed, efpecially in the Weft-Indies, for nailing foft wood. 19. Sheathing-nails, for faftening fheathing-boards to fhips. 20. Square-nails, which are ufed for hard wood, and nailing up wall fruit. 21. Tacks, the fmalleft of which ferve to faften paper to wood; the middling for wool-cards, *&c.* and the larger for upholfterers and pumps.

Nails are faid to be toughened when too brittle, by heating them in a fire-fhovel, and putting fome tallow or greafe among them.

Nails are fold at fix fcore to the hundred: in lathing, 500 are ufually allowed to a bundle of five feet laths, and 600 to a bundle of four feet laths: in flooring, 200 are fufficient for a fquare of flooring. The duties on nails imported, are as follow: chair nails, on importation, pay the thoufand 2 s. $6\frac{80}{100}$ d. and draw back, on exportation, 2 s. 3 d. more if brafs, $7\frac{1}{2}$ d. the whole of which is drawn back on exportation. Copper-nails the ten thoufand, pay, on importation, 2 s. $6\frac{80}{100}$d. and draw back, on exportation, 2 s. 3 d. more for every 112 pounds, 16 s. $4\frac{87\frac{1}{2}}{100}$d. the whole drawn back on being exported. Harnefs-nails, the ten thoufand, pay on importation, 3 s. $10\frac{20}{100}$d. and draw back, on exportation, 3 s. $4\frac{1}{2}$ d. more if brafs, $11\frac{1}{4}$ d. and draw back, the whole on exportation. Head-nails, the barrel, pay, on exportation, 1 l. 10 s. $9\frac{60}{100}$ d. and draw back, on exportation, 1 l. 7 s. and fmall nails in the fame proportion for the half barrel. Rofe-nails, and fadler's-nails, the ten thoufand pay, on importation, 2 s. $6\frac{80}{100}$d. and draw back, on exportation, 2s. 3d. more if brafs, $7\frac{1}{2}$d. and draw back, the whole. Sprig-nails, the ten thoufand, pay on importation, 1 s. $3\frac{40}{100}$ d. and draw back, on exportation, 1 s. $1\frac{1}{2}$d. Befides the above duties, thofe made of iron pay for every 112 pounds weight, on importation, 4 s. $8\frac{1}{4}$ d. which is drawn back on exportation.

NAIL, is alfo a meafure of length, containing the fixteenth part of a yard.

NAIRN, a borough and port-town of Scotland, eighteen miles eaft of the town of Invernefs.

NAISSANT, in heraldry, is applied to any animal iffuing out of the midft of fome ordinary, and fhewing only his head, fhoulders, fore feet and legs, with the tip of his tail, the reft of his body being hid in the fhield, or fome charge upon it; in which it differs from iffuant, which denotes a living creature arifing out of the bottom of any ordinary or charge.

NAKED, in architecture, is the furface or plain from whence the projectures arife;

arise, or which serves as a ground to the projectures. Thus, we say the foliages of a capital ought to answer to the naked of a column, and that a pilaster ought to exceed the naked of the wall by so many inches.

Naked fire, in chemistry, is an open fire; or one where a vessel is immediately exposed to the fire. See the articles Fire and Heat.

Naked seeds, in botany, are those that are not inclosed in any pod or case.

NAKIB, the deputy of the cadilescher of Egypt. See Calilescher.

NAKOUS, a musical instrument, consisting of two brass-plates, which are suspended by strings, and struck together so as to beat time: they are used in the coptic churches in Egypt, and in the mahometan processions.

NAKSIVAN, a city of Persia, in the province of Chirvan: east long. 45°, north lat. 39° 15′.

NAMA, in botany, a genus of the pentandria digynia class of plants, the flower of which consists of five petals; and the fruit is a capsule of an oval figure formed of two valves, and containing only one cell.

NAMATION, the same with naam. See the article Naam.

In Scotland, this word in particularly used for impounding of cattle. See Pound.

NAME, *nomen*, denotes a word whereby men have agreed to express some idea; or which serves to signify a thing or subject spoken of. This the grammarians usually call a noun, though their noun is not of quite so great an extent as our name. See the article Noun.

Names are either proper or appellative. Proper names are those which represent some individual thing or person, so as to distinguish it from all other things of the same species, as Aristotle, which represents a certain philosopher. Proper names are either called Christian, as that given us at baptism, or surnames; the first imposed for the distinction of persons, answering to the roman prænomen; the second for the distinction of families, answering to the nomen of the Romans, and the patronymicum of the Greeks. See the article Patronymic, &c.

The Jews gave the name at the circumcision, *viz.* eight days after the birth: the Romans to females the same day, and to males on the ninth, at which time they held a feast, called nominalia. Since christianity has obtained, most nations have followed the Jews, baptizing and give the name on the eighth day after the birth, but our ancestors till of late baptized and gave the name on the birth-day.

The first imposition of names was founded on different views among different people; the most usual was, to mark the good wishes of the parents, or to entitle the children to the good fortune a happy name seemed to promise, hence Victor, Castor, Faustus, &c. The antient Britons, Camden says, generally took their names from colours, because they painted themselves. When they were subdued by the Romans, they took roman names: the Saxons introduced the german names; the Danes brought with them their names; and the Normans their names. The various names antiently, or at present obtaining among us, from what language or people soever borrowed, are explained by Camden in his remains. In monasteries, the religious assume new names at their admittance, to shew they are about to lead a new life, and have renounced the world, their family, and even their name, as brother Henry of the holy sacrament, sister Mary of the incarnation, &c. The popes also change their names at their exaltation to the pontificate; and it is frequent in Italy to join the name of some saint in a kind of devotion to the christian name.

Appellative, or general names, are those which signify common ideas, or which are common to several individuals of the same specie, as a horse, animal, &c. See the article General Terms.

Specific Name. See the article Specific.

NAMIUM, or Naam, in law. See the article Naam.

NAMUR, a strong city of the Austrian Netherlands, capital of the province of Namur, situated at the confluence of the Sambre and Maese: east long. 4° 50′, north lat. 50° 30′.

The county of Namur is bounded by Brabant on the north; by Liege and Luxemberg, on the east; and by the province of Hainault on the south and west.

Namur-marble, a name given by our artificers to a species of black marble, which is very hard, and capable of a a good polish, but has no variegations of any other colour. It is common in Italy, France,

France, and Germany, and is the ſpecies called the lucullean marble by the Romans. See the article MARBLE.

NANCY, the capital of Lorrain in Germany, ſituated in eaſt long. 6°, north lat. 48° 44′.

NANFIO, one of the iſlands in the Archipelago, ſixteen miles round, and ſituated in eaſt long. 26°, north lat. 35°.

NANGASAQUI, a city on the weſt ſide of the iſland of Bungo, ſituated in eaſt long. 130°, north lat. 32° 30′.

NANKING, the capital of the province of Nanking, and formerly of the empire of China, is ſituated in eaſt long. 118° 30′, north lat. 32°.

NANSAMUND, a county of Virginia, in north America, ſouth of the Iſle of Wight-county, through which the river of Nanſamund runs.

NANTZ, a city of France, in the province of Brittany, ſituated on the river Loire, in weſt long. 1° 30′, north lat. 47° 15′.

NANTUCKET, an iſland on the coaſt of New-England in North-America, ſituated in weſt long. 70°′ north lat. 41°.

NANTWICH, a market-town of Cheſhire, ſituated ſeventeen miles ſouth-weſt of Cheſter.

NAPÆA, in botany, a genus of the monadelphia-polyandria claſs of plants, the calyx of which is a ſingle leafed round permanent perianthium, cut into five ſegments; the corolla conſiſts of five oblong, concave petals, connected by long ungues; the fruit conſiſts of a number of capſules, each containing a ſingle kidney-ſhaped ſeed.

NAPE, a name uſed for the hind part of the neck, ſuppoſed to be on account of the ſhort hair growing there, in reſemblance of the nap of a cloth.

NAPHTHA, in natural hiſtory, a fluid mineral body, of a thin conſiſtence, bright and pellucid, of a ſtrong ſmell, very readily inflammable, and when pure, burning away without leaving any reſiduum.

The naphtha is found in conſiderable quantities floating on the water of certain ſprings, principally breaking out at the ſides of hills in Perſia, Tartary, and ſome parts of the empire of China, where if a lighted candle be held near the ſurface, it takes fire and overſpreads the ſurface of the water for a great extent, with a ſtrong white flame, and emits a very diſagreeable ſmell. The genuine naphtha is very rare in Europe; it is not known to be any where naturally produced here, and what we ſee of it is generally ſophiſticated. Diſtilled by the retort, it yields an oil ſomewhat thinner than it was originally, and of a weaker ſmell. The ſubſtance remaining at the bottom of the retort, has much the reſemblance of amber; and Dr. Hill thinks it highly probable, that the origin of all the amber in the world is from the ſame ſort of principle; nay he tells us that he has ſucceeded ſo far in an attempt to make amber by this fluid and an acid drawn from the crude pyrites, that he has produced a friable ſomewhat pellucid matter, having all the properties of amber except its hardneſs and clearneſs, and yielding a true ſalt and oil of amber on diſtillation. See the article AMBER.

The medicinal virtues of the naphtha are the ſame with the common petroleum, but in a more remiſs degree. It is uſed externally on many occaſions in Perſia; and is taken inwardly, a few drops for a doſe, in colics. The principal uſe made of it, however, is burning in lamps, for which purpoſe it is very proper.

NAPIER's, or NEPER's BONES. See the article NEPER.

NAPLES, the capital of the kingdom of Naples: ſituated in eaſt long. 15°, north lat. 41°.

The kingdom of Naples is one of the Sicilies; it is the ſouth-eaſt part of Italy, and it is ſituated between 14 and 19° eaſt long. and between 38 and 43° north lat. being bounded by the gulph of Venice on the north-eaſt, by the Mediterranean ſea on the ſouth-eaſt, by Sicily and the Tuſcan-ſea on the ſouth-weſt, and by the pope's territories on the north-weſt; and divided from the iſlands of Sicily only by the narrow ſtreight or pharo of Meſſina.

NAPLES YELLOW, the common name in the colour ſhops of London, and among our painters, for the ochre called Giallolino. See the article GIALLOLINO.

NAPOLI DE MALVASIA, a port-town of the Morea, ſituated at the entrance of the gulph of Napoli de Romania, and forty miles ſouth-eaſt of that city.

NAPOLI DE ROMANIA, a city and port-town of European Turky, in the province of the Morea, ſituated at the bottom of a bay of the ſame name in the Archipelago, in eaſt long. 23° 20′, north lat. 37° 30′.

NARBARTH, a town of Pembrokeſhire, in ſouth-Wales, ſituated ten miles north-eaſt of Pembroke.

NARBONE, a city of France, in the province of Languedoc: situated in east long. 2° 40′, north lat. 43° 18′.

NARBOROUGH, an island of South-America, in the Pacific-Ocean, situated on the coast of Chili, in west long. 85°, south lat. 45°.

NARCISSUS, the DAFFODIL, in botany, a genus of the hexandria monogynia class of plants, the corolla whereof consists of a nectarium formed of one leaf of a cylindric or funnel shape, coloured at the top and wide, curled and plicated at the mouth, and of six oval acuminated plane petals affixed externally to the tube of the nectarium above its base: the fruit is a roundish obtusely trigonal capsule, formed of three valves, and containing three cells, in which are a number of round appendiculated seeds, with a columnar receptacle.

The root of this plant is emetic, vulnerary and detergent.

NARCOTICS, in medicine, soporiferous medicines, which excite a stupefaction. See the article OPIATES.

Narcotics, called also hypnotics, anodynes, or stupefactives, are said, by Hoffman, to be such kind of remedies as, by their subtile, noxious, and deleterious exhalations, diminish, or quite destroy the sense and motion of the solid parts. Among narcotics, the most eminent are those which are usually prepared for medicinal uses of the whole poppy, especially opium; as also all those prepared of mandragoras, hyoscyamus, stramonium, and datura. These, says the above-mentioned author, are not without reason reckoned poisons, since they exert their noxious influence in a short space of time, when taken in a small quantity; and a quantity a little larger than ordinary proves mortal. Besides, their principal operation is on the most noble parts of the body, which are the organs of sense and motion; and moreover, they act by means of an element quite opposite to nature, a noisome sulphureous vapour, by which they diminish to a considerable degree, or quite destroy the sense and motion of the motive fibres. The elements by which narcotics act, are of an highly volatile and penetrating nature, since they deeply insinuate themselves like a vapour into the pores of the membranes and nerves, and by contaminating that most pure and moveable fluid, deprive, by little and little, the solids of their tone and motion.

Narcotics act on the nervous membranes of the stomach and intestines, principally by means of a vaporous and fetid sulphur; for as the stomach and intestines first and immediately feel the force and efficacy of remedies, they are so much the more liable to suffer from the influence of medicines which are of a stronger and more penetrating nature than ordinary. These medicines have also a mighty influence on the membranes of the brain, where, by greatly diminishing the spring and systole of the arteries, they cause stagnation of their blood therein, with distensions of the vessels of the head, by which means they induce a torpor, drowsiness, deliriousness, with frightful and troublesome dreams. These medicines were therefore suspected, by the wisest physicians among the antients, in the cure of diseases, on account of their deleterious quality.

NARDO, a port-town of Italy, in the kingdom of Naples: east longitude 19°, north latitude 40° 33′.

NARDUS, SPIKENARD, in botany, a genus of the triandria-digynia class of plants, the corolla whereof is formed of two valves; the exterior is long and of a lanceolato-linear figure; it terminates in an arista or awn, and contains within it the other, which is smaller, and terminates in a shorter awn: the seed is single, of a linear oblong figure, narrower at top than at bottom, and pointed at each end; the corolla surrounds it by way of a pericarpium.

This plant is cephalic and stomachic; it is recommended in nephritic cases, and as a promoter of the menses. It is also given in chronic cases to remove obstructions of the viscera: however, the modern practice does not use it much, except as an ingredient in some of the officinal compositions. It has a very fragrant aromatic smell and taste.

NARRATION, in oratory and history, a recital or rehearsal of a fact as it happened, or when it is supposed to have happened.

Narration is of two kinds, either simple or historical, as where the auditor or reader is supposed to hear or read of a transaction at second hand; or artificial and fabulous, as where their imaginations are raised, and the action is as it were re-acted before them. The narration, according to the writers of rhetoric, makes the second part of a just speech or harangue, *viz.* that immediately

ately

ately following to the exordium. It makes the whole hiftory, abating for the occafional reflections, epifodes and digreffions. Cicero requires four virtues in a narration, *viz.* perfpicuity, probability, brevity, and fweetnefs. The narration is rendered perfpicuous by obferving the order of time, by ufing none but proper and known terms, and by reciting the action uninterruptedly. It is rendered probable by the credibility of the narrator, by the fimplicity and opennefs of the narration, by avoiding every thing far remote from the common fenfe and opinion of mankind, and by a precife detail of circumftances. It is rendered brief by taking it up no higher than is neceffary, nor fetching it back; and by avoiding trivial circumftances. Laftly, it is rendered fweet by ufing fmooth, numerous, and well-founding words; by arranging them fo as to avoid any hiatus or clafhing; by the greatnefs, the novelty, and unexpectednefs of the things related; and by enriching it with tropes and figures. See History, Oratory, Trope, *&c.*

Narration, in poetry, is ufed for the action, or event, that make the fubject of an epic poem.

For the virtues of the poetic narration, fee the article Epic.

NARWAL, in ichthyology, the unicorn-fifh, fo called from a long wreathed tooth, ten or more feet in length, which has more the appearance of a horn than of a tooth; though it be really a tooth fixed in the gomphofis of the upper jaw, altogether in the manner of other teeth: hence fome have called it monodon, which is certainly a more proper name than that of the unicorn-fifh.

The narwal is a fifh of the whale-kind, often growing to twenty five feet in length, but is more commonly found from fixteen to twenty.

NARVAR, a city of the hither India, the capital of the province of Narvar: eaft long. 79°, north lat. 25°.

NASALIA, in medicine, a fort of remedies to be taken by the nofe, called alfo errhines. See the article Errhines.

NASIAS, in anatomy, a thin bone making the upper part of the nofe. See the article Nose.

NASSAU, the capital of the county of the fame name in Germany: eaft long. 7° 25′, north lat. 50° 21′.

NASUS, in ichthyology, the cyprinus with a nafiform fnout, and fourteen rays in the pinna ani. See Cyprinus.

NATA, a port-town of Darien, fituated on the bay of Panama.

NATAL terra, a country on the fouth-eaft coaft of Africa, between 23° and 30° of fouth latitude, and between 25° and 35° of eaft longitude.

NATALIS, or natalis dies, properly fignifies a man's birth-day; but was ufed by the heathens to fignify the feaft held on the anniverfary of the birth-day of an emperor, whence it came in time to fignify any fort of feaft; and the primitive chriftians ufed it in this fenfe.

Ludi natalitii, Natal-games, thofe introduced on the anniverfaries of the birth-days of great men.

NATES, in anatomy, a term expreffing thofe two flefhy exterior parts of the body, vulgarly called the buttocks.

Nates cerebri, two circular protuberances of the brain, fituated on the backfide of the medulla oblongata, near the cerebellum. See Brain and Medulla.

NATION, a collective term, ufed for a confiderable people inhabiting a certain extent of land, confined within fixed limits, and under the fame government.

In fome univerfities the word nation is ufed for a diftinction of the fcholars, the profeffors and colleges: thus the faculty of arts in the univerfity of Paris, confifts of four nations; *viz.* that of France, that of Normandy, that of Picardy, and that of Germany; which laft comprehends all foreign nations, as the Englifh, Italians, *&c.*

NATIVE, a perfon confidered as born in a certain place which was the proper refidence of his parents, and where he received his education.

Native, or Nativus, in our antient law-books, fignifies a perfon born in a ftate of villainage, in contradiftinction to a bonds-man, or one who became a villain by his own act and deed.

NATIVITY, or Natal-day, the day of a perfon's birth. The word nativity is chiefly ufed in fpeaking of the faints, as the nativity of St. John the Baptift, *&c.* But when we fay the Nativity, it is underftood of that of Jefus Chrift, or the feaft of Chriftmas. See the article Christmas.

Nativity, in old law-books, fignifies villainage or fervitude.

Nativity, in aftrology, the fituation of the heavens, and particularly of the twelve houfes at the moment of a perfon's birth. See the article Horoscope.

NATIVO Habendo, a writ which antiently

ſiently lay for apprehending a villain and reſtoring him to his lord.

NATOLIA, the modern name of the leſſer Aſia; being the moſt weſterly part of Turky in Aſia, and conſiſting of a large peninſula, which extends from the river Euphrates, as far as the Archipelago, the ſea of Marmora, the ſtraits of Galipoli and of Conſtantinople, which ſeparate it from Europe on the weſt. It is bounded on the north by the Black ſea, and on the ſouth by the Mediterranean ſea.

NATRIX, in zoology, a ſpecies of ſerpent with one hundred ſeventy-ſix ſcuta upon the abdomen, and ſixty ſquamæ on the tail. See the article SERPENT.

NATRUM, the nitre of the antients, in natural hiſtory, is a genuine, pure and native ſalt, extremely different from our nitre, and indeed from all the other native ſalts; it being a fixed alkali, plainly of the nature of thoſe made by fire from vegetables, yet capable of a regular cryſtallization, which thoſe ſalts are not. It is found on the ſurface of the earth, or at very ſmall depths within it, and is naturally formed into thin and flat cakes or cruſts, which are of a ſpungy or cavernous ſubſtance, very light and friable, and when pure, of a pale browniſh-white; but as its ſpungy texture renders it very ſubject to be fouled by earth received into its pores, it is often met with of a deep dirty-brown, and not unfrequently reddiſh.

Natrum, whether native or purified, diſſolves in a very ſmall quantity of water; and this ſolution is, in many parts of Aſia, uſed for waſhing; where it is alſo made into ſoap by mixing it with oil. Natrum reduced to powder, and mixed with ſand or flints, or with any other ſtone of which cryſtal is the baſis, makes them readily run into glaſs. Gold heated red-hot, and ſprinkled with a ſmall quantity of this ſalt, melts immediately; ſilver ignited and ſprinkled with it, melts in the ſame manner; as does alſo iron, copper, and the regulus of antimony, which melt much more eaſily than they otherwiſe would do. Mercury will not be mixed with it by any art, and indeed will not amalgamate with metals if only a little of this ſalt be added. It is found in great abundance in many parts of Aſia, where the natives ſweep it up from the ſurface of the ground and call it ſoap-earth. The earlieſt account we have of it is in the Scriptures, where we find that the ſalt called nitre in thoſe times would ferment with vinegar, and had an abſterſive quality, ſo that it was uſed in baths and in waſhing things. Solomon compares the ſinging of ſongs with a heavy heart, to the contrariety of vinegar and nitre; and Jeremiah ſays, that if the ſinner waſh himſelf with nitre his ſin is not cleanſed off. Theſe are properties that perfectly agree with this ſalt, but not at all with our ſalt-petre.

NATTA, in ſurgery, a tumour of the oedematous kind. See OEDEMA.

NATURAL, in general, ſomething that relates to nature. See NATURE.

Natural-children are thoſe born out of lawful wedlock.

The natural-functions, are thoſe actions whereby the aliments are changed and aſſimilated ſo as to become a part of the body. See the articles FUNCTION, DIGESTION, CHYLIFICATION, *&c.*

NATURAL HISTORY, a deſcription of the productions of the earth, air, water, *&c.* See the articles EARTH, *&c.*

The natural-hiſtory of any one place is a very extenſive ſubject, which, according to Mr. Boyle, may be conveniently reduced to four heads, *viz.* the things that regard the heavens, the air, the waters, and the earth.

Of the firſt claſs, are the longitudes and latitudes of places, the lengths of the longeſt and ſhorteſt days and nights; the climates, parallels, *&c.* what fixed ſtars are ſeen, and what are not ſeen there.

About the air may be obſerved, its temperature, as to the firſt four qualities, and the meaſure of them; its weight, clearneſs, and refractive power; its ſubtilty or coarſeneſs; its abounding with or wanting an eſurine ſalt; its variations according to the ſeaſons of the year, and the times of the day; what duration the ſeveral kinds of weather uſually have; what meteors it is moſt or leaſt apt to breed; and in what order they are generated, and how long they generally laſt; what winds it is moſt ſubject to; whether any of them be ſtated or ordinary; what diſeaſes are ſaid to be epidemical, or depending on the ſtate and condition of the air; what other diſeaſes it is ſubject to, wherein the air may be ſuppoſed to have ſome ſhare; what is the uſual ſalubrity of it, and what ſort of conſtitutions it agrees with, what does not. See the article AIR.

About the waters, it may be proper to obſerve the ſea, its depth, tides, cur-

vents, faltnefs, and other qualities; next the rivers will come under confideration, their depth, length, courfe, inundation, and the goodnefs or badnefs of their waters, with their gravity, and other peculiar qualities; after thefe, the lakes, fprings, ponds, *&c.* are to be confidered, efpecially the mineral waters, their kinds, qualities and virtues, and the manner of trying them: the inhabitants of the waters may follow here; and the particular kinds of fifh that are found there, whether of the fea or rivers, are to be mentioned, with an account of their ftores, bignefs, goodnefs, feafons of perfection, haunts, peculiarities of any kind relating to them, and the manner of taking them, efpecially when there is any thing fingular in it.

The things relating to the earth, are laft to be examined: thefe are, firft the earth itfelf, then its inhabitants, and its various productions, whether external or internal. In the earth itfelf may be obferved, its dimenfions, fituation eaft, weft, north and fouth; its figure; its plains and valleys, and their extent; its hills and mountains, and the height of the talleft, both in reference to the neighbouring valleys and plains, and to the level of the fea; as alfo whether the mountains lie fcattered, or are difpofed in ridges; and if of the latter kind, whether they run eaft, weft, north or fouth. What promontories alfo, and what fiery or fmoaking hills it has, if any: whether the country be coherent, or much broken into iflands: what the magnetical declination is in feveral places, and the variation of that declination in the fame place, and if thofe be confiderable; what may be conjectured as the occafions of them, whether the vicinity of iron-mines, of fubterraneous fires, or what elfe. What the nature of the foil is, whether clayey, fandy, or of good mould; and what vegetables, plants and trees beft agree with it and fucceed in it, what worft. By what particular contrivances the inhabitants improve the advantages, or remedy the difadvantages of the foil; and what hidden qualities the foil may have. The inhabitants of the earth are then to be confidered, both natives, and ftrangers that have been long fettled there; and in particular, their ftature, colour, features, ftrength, agility, or defects of thefe; and their complexions, hair, beauty, and the like; their diet, inclinations and cuftoms, fo far as they are not owing to education; the fruitfulnefs or barrennefs of the women; their hard or eafy labours; the difeafes they are moft fubject to, and any remarkable fymptoms attending them.

As to the external productions of the earth, the enquiries are to be thefe: what graffes, grains and fruit it beft produces: the herbs, flowers, and timber-trees; and the coppices, groves, forefts and woods the country has or wants: what peculiarities are obfervable in any of them; what foils they moft like or diflike, and with what culture they thrive beft. Then what animals the country has or wants, both as to wild beafts and birds of prey, and as to poultry and cattle of all forts; and particularly, if they have any animals that are not common, or any thing particular in thofe they have. After thofe, the fubterraneous ftores are to be examined; what minerals the earth affords, and what it wants: then what quarries of ftone, and in what manner they lie: what clays and earths are found there; as, clays, marles, fuller's earths, earths for tobacco-pipes, earth for potter's wares, medicinal earths: what other mineral productions it yields, whether coals, falt-mines, or falt-fprings, alum, vitriol, fulphur, *&c.* What metals the country yields, with a defcription of the mines of them; their depths, numbers, fituations, figns, waters, damps, quantities of ores, goodnefs of the ores, and the ways in ufe for the reducing them to metals.

To thefe general heads fhould be added, inquiries into traditions in the country, of any thing relating to it, whether peculiar to it, or only more common there than elfewhere; and where thefe require learning or fkill in the anfwer, the utmoft care is to be taken to put the people in a way to give their accounts in a fatiffactory manner; for a falfe or bad account of any thing, is always much worfe than no account at all.

NATURAL INCLINATIONS, are the tendencies of our minds towards things feemingly good. See the articles GOOD and PASSIONS.

NATURAL PHILOSOPHY, that which confiders the powers and properties of natural bodies, and their mutual actions on one another.

The bufinefs of natural philofophers, fays Boerhaave, is to communicate a folid and accurate knowledge of all the bodies in being, and all the affections thereof.

Nor

Nor can this ſcience be acquired otherwiſe than by obſerving, by means of our ſenſes, all the objects which the author of nature has made cognizable thereto: hence, the firſt and principal part of this ſcience is to collect all the manifeſt and ſenſible appearances of things, and reduce them into a body of natural hiſtory. Now there are two ways of making ſuch obſervations; the firſt when we view things nearly as they happen to turn up, without any deſign or intervention of our own; in which way no great improvements can be expected in the art, becauſe chance having here the direction, only exhibits occaſional or extemporary properties: the other method is, when, after a thorough acquaintance with bodies, we apply them to other bodies equally known, diligently attending to the reſult, and obſerving whether any thing new ariſes. See the article EXPERIMENTAL PHILOSOPHY.

NATURAL, in muſic, is a term variouſly uſed: thus natural muſic is the ſame with vocal, in oppoſition to artificial muſic, or that performed on inſtruments. A ſong is alſo called natural, when its notes move eaſily and gracefully, the voice or inſtrument being nowiſe forced or ſtrained. Natural harmony is that produced by the natural and eſſential chord of the mode. See the articles MODE and HARMONY.

A natural note is uſed to contradict thoſe flats and ſharps that are uſed at the beginning of a ſtave; and in ſuch caſe, it muſt be taken exactly as in the gamut. For the character of this note, ſee the article CHARACTER.

NATURAL, in heraldry, is when animals, fruits, flowers, &c. are blazoned with their natural colours.

NATURALIST, a perſon well verſed in the ſtudy of nature, and the knowledge of natural bodies, eſpecially in what relates to animals, vegetables, metals, minerals, and ſtones. See the article NATURAL PHILOSOPHY.

NATURALIZATION, in law, the act of naturalizing an alien, or placing him in the condition of a natural born ſubject. In England, this is done by act of parliament; but none can be naturalized before they have received the ſacrament of the church, and taken the oaths of allegiance and ſupremacy. A perſon who is naturalized may have lands by deſcent, as heirs at law, as well as obtain them by purchaſe: but they are diſabled from being of the king's privy council, or of holding offices, 7 Jac. I. 12 W. III. c. 2. By a late ſtatute it is ordained, that all children born out of the king's dominions, whoſe fathers were or are natural ſubjects to this kingdom at the time of their birth, ſhall be adjudged natural-born ſubjects of this realm, except children of parents who are attainted of treaſon, or that are in the actual ſervice of a foreign prince at enmity with us. 4 Geo. II. c. 2. By an act of 13 Geo. II. all Jews who have reſided in the britiſh colonies in America, without being abſent two months at any one time, are declared naturalized without their receiving the ſacrament of the Lord's ſupper.

NATURALS, *res naturales*, among phyſicians, whatever naturally belongs to an animal, in oppoſition to non-naturals. See the artiticle NON-NATURALS.

NATURE, *natura*, according to Mr. Boyle, has eight different ſignifications; it being uſed, 1. For the author of nature, whom the ſchoolmen call *natura naturans*, being the ſame with God. 2. By the nature of a thing, we ſometimes mean its eſſence; that is, the attributes which make it what it is, whether the thing be corporeal or not; as when we attempt to define the nature of a fluid, of a triangle, &c. 3. Sometimes we confound that which a man has by nature, with what accrues to him by birth; as when we ſay, that ſuch a man is noble by nature. 4. Sometimes we take nature for an internal principle of motion; as when we ſay, that a ſtone by nature falls to the earth. 5. Sometimes we underſtand, by nature, the eſtabliſhed courſe of things. 6. Sometimes we take nature for an aggregate of powers belonging to a body, eſpecially a living one; in which ſenſe phyſicians ſay, that nature is ſtrong, weak, or ſpent; or that, in ſuch and ſuch diſeaſes, nature left to herſelf will perform the cure. 7. Sometimes we uſe the term nature for the univerſe, or whole ſyſtem of the corporeal works of God; as when it is ſaid of a phœnix, or chimera, that there is no ſuch thing in nature. 8. Sometimes too, and that moſt commonly, we expreſs by the word nature a kind of ſemi-deity, or other ſtrange kind of being.

If, ſays the ſame philoſopher, I were to propoſe a notion of nature, leſs ambiguous than thoſe already mentioned, and with regard to which many axioms, relating

lating to that word, may be conveniently understood, I should first distinguish between the universal and the particular nature of things. Universal nature I would define to be the aggregate of the bodies that make up the world, in its present state, considered as a principle; by virtue whereof they act and suffer, according to the laws of motion, prescribed by the author of all things. See the articles BODY, INERTIA, MOTION, &c. And this makes way for the other subordinate notion; since the particular nature of an individual consists in the general nature, applied to a distinct portion of the universe; or, which is the same thing, it is a particular assemblage of the mechanical properties of matter, as figure, motion, &c.

Those who desire a more particular discussion of each of these opinions, may consult Boyle's Free Inquiry into the vulgar notion of nature.

NAVAL AFFAIRS, comprehend whatever relates to navigation, ship-building, sailors, &c. See the articles NAVIGATION, and *Construction* of SHIPS.

The history of the naval affairs of any one state is a very comprehensive subject, much more that of all nations. Those who would be informed of the maritime affairs of England, and the figure it has made at sea in all ages, may find abundance of curious matter in Selden's Mare Clausum; and from his time to ours, we may trace a series of facts in Lediard's and Burchet's Naval History.

Not only the preservation of that share of commerce we at present possess, but its future advancement, and even the very being of Great Britain, as an independent empire, and a free people, depend no less on the good condition and the wise regulation of our naval affairs, than on the superiority of its maritime power: and that the legislature has been ever attentive to this great and important object, will appear from the following account of the laws that have been enacted relating to the naval affairs of Great Britain.

So early as 5 Rich. II. c. 3. it was enacted, that none of the king's subjects should bring in or carry out any merchandize, but in english ships, on pain of forfeiting all the merchandize otherwise conveyed, or the value thereof: but 6 Rich. II. ordains, that the above statute shall only take place where able ships belonging to the king's subjects are to be found; for where they are not to be had, the merchants are allowed to hire other ships. By 4 Hen. VII. c. 10. it was enacted, that no Gascoign or Guienne-wines, &c. should be imported into this realm but in english vessels: and that none should freight any merchandize in any stranger's ship, if he could have sufficient freight in a denizen's ship, under the penalty of forfeiting all merchandize not thus shipped, to be divided between the king and the seizer: but this act, so far as it related to the above wines, was repealed by the statute 32 Hen. VIII. c. 14. and a rate was ordered of what should be paid for the freight of the several sorts of merchandize in ships, from the port of London to other places, and from thence to London. By 1 Eliz. c. 13. it was enacted, that if the owner of any merchandize should, in the time of peace, embark or unload any part thereof, (masts, pitch, tar and corn only excepted) out of, or into any foreign ship, he should pay custom as an alien.

By the act of navigation, 12 Car. II. c. 18. it is enacted, that no goods shall be imported into, or exported out of, any territories belonging to, or that may hereafter belong to his majesty, his heirs and successors, in Asia, Africa, or America, in any other ships besides such as belong to the people of England, Ireland, Wales, or the town of Berwick upon Tweed, and whereof the master and three fourths of the mariners are English, on pain of forfeiting both the ship and lading, one third part to the king, another to the governor of the country where such default shall be, if seized there, otherwise that third also to the king, and the other third to him that will seize or sue for the same. And commanders at sea, having the king's commission, are to bring in as prize all such ships, and on their being condemned, one moiety is to be for the use of such commanders and their companies, and the other moiety to the king. No goods of the growth or manufacture of Muscovy, or of the produce of the turkish empire, shall be imported into England, Ireland, &c. in any ship or vessel not english built, or not belonging to the people of England, Ireland, &c. and navigated as aforesaid; except vessels built at the place from whence the goods came, or of such port where they can only be, and usually are shipped, on pain of forfeiting the ship and

and goods: and all wines of the growth of France and Germany, and divers goods and merchandize from Spain, Portugal, Ruſſia, &c. which ſhall be imported into the places aforeſaid, in any other ſhip than what doth belong to England, Ireland, &c. and are navigated as aforeſaid, ſhall be deemed alien's goods, and pay accordingly. And no foreign-built veſſel ſhall paſs as a ſhip belonging to England, Ireland, Wales, &c. till the owner makes it appear to the chief officer of the cuſtoms, in the port next to the place of his abode, that he is not an alien, and take an oath that it was *bona fide* bought of ſuch perſons, expreſſing the ſum given, and the time and place when and where, &c. and that no foreigner has a ſhare in it. Alſo none ſhall load in any bottom, if ſtrangers are owners, part-owners, or maſter, and of which three fourths of the mariners at leaſt are not Engliſh, any goods whatſoever from one port or creek of England, Ireland, Wales, Guernſey, Jerſey, or the town of Berwick, to another port of the ſame, on pain of forfeiting ſuch goods and veſſel.

The 22 and 23 Car. II. c. 11. ordains, that where any goods ſhall be laden on board any engliſh ſhip of the burden of two hundred tons, or upwards, and mounted with ſixteen guns, or more, if the maſter yields up ſuch ſhip or goods to any turkiſh veſſel, or any pirate, without fighting, upon proof thereof in the admiralty, he ſhall be incapable of taking charge of any engliſh veſſel: and maſters of engliſh ſhips, though not of that burden, nor mounted as aforeſaid, that ſhall yield without fighting to a turkiſh ſhip or pirate, that has not at leaſt double the number of guns, ſhall be liable to the penalties of this act. If any inferior officers or mariners of a ſhip, ſhall refuſe to fight when commanded, or utter words to diſcourage others, they ſhall loſe all their wages due, and be impriſoned not exceeding ſix months; and mariners laying violent hands on their commanders, to hinder them from fighting in defence of their ſhips, ſhall ſuffer death as felons. When any engliſh ſhip ſhall have been defended by fight, and brought to her port, in which fighting any of her men have been wounded or ſlain, the judge of the admiralty, or his ſurrogate, &c. where ſhe ſhall arrive, upon the petition of the maſter and ſeamen, may call ſo many as he ſhall be informed are the adventurers and owners, and by adviſing with them, levy upon the reſpective owners ſuch ſums as he himſelf, and the major part of them preſent, ſhall judge reaſonable, not exceeding two *per cent.* of the ſhip and goods: which money ſhall be diſtributed among the maſter, officers and ſeamen, or the widows and children of the ſlain, according to the direction of the judge, with the approbation of three or more of the adventurers.

By the 5th and 6th of Will. and Mary, c. 24, every perſon who ſhall build, or cauſe to be built, any ſhip of three decks, containing 450 tons, and mounted with thirty-two pieces of ordnance, having ammunition, &c. proportionable, ſhall for the firſt three voyages which the ſaid ſhip ſhall make to any foreign parts, receive a tenth of the cuſtoms called the ſubſidy of tonnage and poundage, payable for merchandize exported and imported in ſuch ſhips: but if after the end of the three firſt voyages, ſhips ſo built, ſhall be altered ſo as to become leſs defenſible than they were at firſt, then they ſhall be forfeited and loſt.

By 2 Ann. c. 9. owners of ſhips might navigate during the war with France, with maſters and only one half of the mariners engliſh: and by 3 and 4 Ann. c. 13. any ſhips might be navigated by foreign ſeamen; and foreigners ſerving on board any engliſh ſhip for two years, were to be deemed natural-born ſubjects, &c.

By 4 Geo. I. c. 12. and 11 Geo. I. c. 29. if any officer or mariner belonging to any ſhip or veſſel, ſhall wilfully caſt away, burn or deſtroy the ſhip to which he belongeth, or in any-wiſe direct or procure the ſame to be done, with intent to prejudice a perſon that ſhall have granted any inſurance thereon, or any merchant who ſhall load goods therein, or any owner of ſuch veſſel, the perſons offending ſhall on conviction be adjudged guilty of felony without benefit of clergy.

The 5th of Geo. II. c. 20. enacts, that no commander of any ſhip outward-bound ſhall receive on board any gunpowder, either as merchandize or ſtores for the voyage, except for his majeſty's ſervice, before ſuch ſhip ſhall be at Blackwall, in the river Thames; and all maſters of ſhips coming into the river, ſhall put on ſhore all powder either before the arrival of their ſhips at the ſaid place,

place, or within twenty-four hours after they come to anchor there, upon pain of forfeiting 5 l. for every 50 pounds weight of gunpowder on board, and in the like proportion for a lefs quantity. And no guns fhall be kept loaded with fhot in merchant-fhips between London bridge and Blackwall, or fired before the rifing, or after the fetting of the fun, under the penalty of 5 l. and for every gun fo fired, 10 s. And if any pitch, tar, rofin, or other combuftible matter fhall be heated or melted by fire in any fhips, every perfon fo offending, fhall, for every offence, forfeit 5 l. And fhips are liable to be fearched by an elder brother, appointed by the mafter, wardens, and affiftants of the Trinity-houfe at Deptford. In cafe any fhip fhall be moored in the mouth or any other part of St. Saviour's dock, except fuch fhips as fhall be loading or delivering their cargoes, and others, not exceeding two at a time, that fhall lie at fhipwright-yard, at the north-weft corner of the faid dock, during the time they fhall be repairing, the mafter of fuch fhip fhall forfeit 20 s. for every day fhe fhall continue to be laid up and moored. By 6 Geo. II. c. 29. mafters of fhips lying in the river Thames who have occafion for ballaft, fhall pay 1 s. per ton colliers, other fhips 1 s. 3 d. and foreign fhips 1 s. 7 d. per ton, to the corporation of the Trinity-houfe at Deptford; who fhall pay ballaft men 9 d. a ton, for raifing and carrying it, *&c.* and it fhall be lawful for any mafter of a fhip to appoint two perfons to go on board any lighter bringing ballaft to fuch fhip, to infpect the marks thereof; and every ballaft-man fhall immediately before the delivery of ballaft to any fhip, trim fuch lighter, fo as to make it fwim at equal marks at the ftem and ftern, and pump all the water out, *&c.* and the mafter, wardens, and affiftants of the Trinity-houfe, are to make good to the mafter, the quantity or value of the ballaft which fhall be found deficient, or forfeit 50 l. one moiety to the poor, and the other to the perfon fuing for it. The 7th of Geo. II. c. 15. ordains, that no owners of fhips fhall be liable to any lofs by reafon of embezzlement by the mafter or mariners, of any goods or merchandize fhiped on board, or for any act done by them, without the privity or knowledge of fuch owners, further than the value of the fhip, and amount of the freight during the voyage, in which fuch embezzlement of the mafter or mariners fhall be committed: and if feveral perfons fhall fuffer damage by the means aforefaid, and the value of the fhip and cargo fhould not be fufficient to make compenfation; then the freighters fhall receive fatisfaction in average, in proportion to their refpective loffes, to be afcertained on a bill in equity, exhibited for a difcovery thereof, and of the value of fuch fhip and freight. But nothing in this act fhall difcharge any remedy, which any perfon may have againft the mafter and mariners, in refpect of an imbezzlement. See the articles FREIGHT, INSURANCE, *&c.*

NAVAL STORES comprehend all thofe particulars made ufe of, not only in the royal navy, but in every other kind of navigation; as timber and iron for fhipping, pitch, tar, hemp, cordage, failcloth, gun powder, ordnance, and firearms of every fort, fhip-chandlery wares, *&c.* In order to encourage the importation of naval ftores from Scotland and our own plantations, the following premiums have been granted for a certain time, and continued by feveral acts, from the third and fourth years of the reign of queen Anne, to the twenty-fourth of his late majefty's reign, *viz.*

	l.	s.	d.
Hemp, water-rotted, bright and clean, from Scotland, or the britifh plantations in America, the ton - -	6	0	0
Trees of twelve inches in diameter and upwards, fit for mafts, yards, or bow-fprits, regularly converted, and turned at leaft into eight fquares, found and frefh, the ton, allowing 40 feet to each ton, girt-meafure - -	1	0	0
The following from the britifh plantations in America.			
Mafts, yards, and bow-fprits, the ton, allowing 40 feet to the ton, - -	1	0	0
Clean merchantable tar, fit for making cordage, the ton,	2	4	0
Clean merchantable tar, prepared from green trees, by ftripping off the bark, without cutting them down, fit for making cordage, per ton,	4	0	0
Clean and good pitch, per ton,	1	0	0
Clean and good turpentine, per ton, - -	1	10	0

The laft act which grants thefe bounties, was to continue in force till the year 1757.

Upon

Upon the landing of these stores, the refusal must be offered to the commissioners of the navy; and if, within twenty days after such tender, they shall not contract for them, the importers may otherwise dispose of them. No fee, gratuity, or reward, may be demanded or taken by the officers of the customs, for examining, viewing, or delivering any of the aforesaid naval stores; or for making or signing certificates, in order to receive the premium, upon forfeiture of office and 100 l. and being rendered incapable of serving his majesty. And if any of these naval stores, except hemp, shall be again exported, the exporter must, before entry thereof, produce to the collector, *&c.* of the customs, at the port of exportation, a receipt from the treasurer of the navy, or his cashier, subscribed by his comptroller, or his chief clerk, signifying that the full amount of the premium had been repaid to him: on failure whereof, such stores may not be exported; and if such stores are fraudulently exported without repayment of the premium, they are forfeited, with double the value.

NAVAL CROWN, *corona navalis*, in roman antiquity. See the article CROWN.

NAVARINO, a port-town of european Turkey, in the Morea, ninety miles south-west of Corinth.

NAVARRE, a province of Spain, bounded by french Navarre on the north-east, by Arragon on the south-east, by old Castile on the south-west, and by Guipuscoa on the west. It is a mountainous country.

French Navarre, separated from spanish Navarre on the south-west by the Pyrenees, is only thirty miles long and fifteen broad; being one of the most barren provinces in France.

NAVE, in architecture, the body of a church, where the people are disposed, reaching from the ballufter, or rail of the choir, to the chief door.

Some derive the word nave from ναός, a temple; and others, from ναῦς, a ship, by reason the vault or roof of a church bears some resemblance to a ship.

NAVEL, *umbilicus*, in anatomy, the center of the lower part of the abdomen; being that part where the umbilical vessels passed out of the fœtus to the placenta of the mother. See the articles ABDOMEN, FOETUS, *&c.*

The navel-string, or funiculus umbilicalis, of the fœtus, besides its vein and two arteries, is composed of a spongy substance in which these vessels are lodged, which upon entering the placenta, are divided into numerous branches, and lesser ramifications.

As soon as the infant and after-burden are delivered, a firm ligature is made upon the navel-string, with a strong thread folded several times together, and about two or three fingers-breadth from the abdomen: this done, the navel-string leading to the placenta is to be cut off, and the wound dressed with lint, till the part on which the ligature was made, becoming dry, falls off of itself.

NAVEL-WORT, *cotyledon*, in botany. See the article COTYLEDON.

NAVEREINI, a town of Gascony, in France, sixteen miles south-east of Bayonne.

NAVEW, in botany. See the article RAPE SEED.

NAVICULARE OS, in anatomy, a bone of the foot, lying between the astragalus and ossa cuneiformia, and so called from its resemblance to a boat. See the articles FOOT, ASTRAGALUS, *&c.*

It has a glenoid cavity, for its articulation with the head of the astragalus; and its anterior faces are received into the sinuses of the ossa cuneiformia.

NAVIDAD, a port-town of Mexico, in the province of Mechoachan: west long. 110°, and north lat. 19°.

NAUGRACUT, a city of the hither India, the capital of a province of the same name: east long. 78°, and north lat. 33°.

NAVIGATION, the art of conducting or carrying a ship from one port to another. See the article SHIP.

Navigation implies not only the mechanical art of managing the sails, and working a ship; that is, of causing it to observe such motions and directions, as are assigned by the navigator; which must be learned on ship-board, and in the practice of sailing: but likewise the theory thereof, which depends on the navigator's being before-hand furnished with the following elements.

1. A table of the latitudes and longitudes or the most remarkable parts of the sea-coasts, islands, rocks, shoals, *&c.* in the frequented parts of the world. See the articles LATITUDE and LONGITUDE.

2. Maps and charts of the seas and lands, together with the depths of water, and the times

times and setting of the tides upon the coast he may have occasion to approach near. See CHART, MAP, TIDES, &c.

3. The use and application of several instruments, necessary to point out the way the ship is to steer, to measure the rate she runs at, and to find the place she is in at any time. See the articles COMPASS, LOG, BACK-STAFF, FORE-STAFF, QUADRANT, &c.

4. A sufficient stock of mathematical learning, to enable him to make a right use of the observations that may be deduced from the preceding elements; but, particularly trigonometry. See the article TRIGONOMETRY.

Before we come to the particular methods of navigation, called plane-sailing, middle-latitude sailing, Mercator's sailing, &c. we shall explain what is meant by the terms course, distance, &c. Thus, let A (plate CLXXXVI. fig. 1. nº 1.) be a place on the earth's surface, and A C its meridian; and suppose a ship to sail from A, on the N. E. rhumb, till she rrive at B: then the angle C A B, represents the course; A B the distance sailed; A C, the difference of latitude, in this case called northing; and C B, the departure. Hence it is plain, that the distance sailed will always be greater than either the difference of latitude or departure; it being the hypothenuse of a right-angled triangle, whereof the other two are the legs. But if a ship sails either due north or south, she sails on a meridian, makes no departure, and her distance and difference of latitude are the same. If a ship sails either due east or west, she runs on a parallel of latitude, makes no difference of latitude, and her departure and distance are the same. When the course is 45°, or 4 points, as in the above example, the difference of latitude and departure are equal. When the course is less than 45°, the difference of latitude is greater than the departure; and, *vice versa*, when the course is greater than 45°.

When a figure relating to a ship's course is to be constructed, it must, first be considered, whether the ship is sailing northward or southward, and whether she goes to the eastward or westward of the place from which she departs. Thus, let the upper part of the paper, of whatever the figure is drawn on, always represent the north, then the lower part will be the south, the right hand side the east, and the left side the west; and the lines representing the difference of latitude, departure, and distance, are to be drawn and denominated accordingly.

Plain, or *Plane-Sailing*, is that method of navigating a ship, which supposes the earth to be an extended plane, as explained under the article CHART.

Case I. One latitude, course, and distance sailed, being given; to find the other latitude, and departure from the meridian.

Example: Suppose a ship in the latitude of 4° 10′ N. sails S. S W. 194 miles; required the latitude she is in, and how far she hath departed from her former meridian?

Geometrically: Let the place of the ship be O (plate XL. fig. 5.) draw the meridian O P, and the right line O Q, forming an angle with the meridian O P = 22° 30′ = 2 points, the course steered; set off, on the line O Q, 194 miles, the distance sailed, from O to Q; from the point Q let fall the perpendicular Q P, on the meridian O P, and the triangle is constructed; and the lines O P and P Q, the difference of latitude and departure, may be measured by applying them to graduated lines on the chart, or to the same scale of equal parts which O Q was taken from.

Arithmetically: 1. For the difference of latitude, or side O P, the proportion will be;

As radius = 90° - - - - -	= 10.0000000
To the distance sailed O Q = 194 - -	= 2.2878017
So is the co-sine of the course = 67° 30′ = angle Q -	= 9.9656153
To the difference of latitude O P = 179 - - -	= 2.2534170

2. For the departure, or side P Q, the proportion is;

As radius = 90° - - - - - -	= 10.0000000
To the distance sailed O Q = 194 - - - -	= 2.2878017
So is the sine of the course 22° 30′ = angle O -	= 9.6006997
To P Q, the departure required = 77 - - -	= 1.8885014

Case II.

Case II. Both latitudes and course being given, to find the distance and departure.

Example: Suppose a ship in the latitude 3° 10′ S. sails N. E. by N. till her difference of latitude be 2° 20′; required the distance sailed, and departure from the meridian?

Geometrically: Let R *(ibid.)* be the place the ship sailed from, on the chart; draw the meridian R S, setting off on it 140 miles = the difference of latitude, from R to S; and erecting the perpendicular S T, draw the rhumb-line R T, making an angle with the meridian R S = 33° 45′ = the course steered, continuing it till it cut the perpendicular in T; then will T be the place of the ship on the chart; and the distance R T, and departure S T, may both be measured by applying them to the graduated lines, or the same scale R S was taken from.

Arithmetically: 1. To find the distance sailed, it will be;

As the complement of the course = 56° 15′ = the angle T	-	= 9.9198464
To the difference of latitude = 140 = R S	- -	= 2.1461280
So is radius = 90°	- - - -	= 10.0000000
To the distance required = 168.4 = R T	- -	= 2.2262816

2. For the departure, the proportion will be;

As radius = 90°	- - - -	= 10.0000000
To the distance R T = 168.4	- - -	= 2.2262816
So is the sine of the course, or angle R = 33° 45′	-	= 9.7447390
To S T, the departure required = 93.5	- -	= 1.9710206

Case III. Both latitudes and distance sailed being given, to find the course and departure.

Example: Admit a ship, in the latitude of 1° S. sails between the north and east 96 miles, till her difference of latitude be 1° 10′; required the course and departure?

Geometrically: Let V. *(ibid.)* be the place the ship sailed from, on the chart; draw the meridian V W, setting off on it 70, the difference of latitude, from V to W; and erecting the perpendicular W X, take the distance sailed between the points of the compasses, and, setting one foot in V, with the other cross the perpendicular in X, which will be the place the ship is arrived at, on the chart; and the course or angle W V X, may be measured by the line of chords, and the departure W X, by applying it to the graduated lines on the chart, or to the same scale V X was taken from.

Arithmetically: 1. To find the course, or angle W V X, it will be;

As V X, the distance sailed, = 96	- - -	= 1.9822712
To radius 90°	- - - -	= 10.0000000
So is V W, the difference of latitude = 70	- -	= 1.8450980
To the sine of the angle X, the complement of the course = 46° 49′		= 9.8628268

Which being taken from 90°, gives 43° 11′, the course steered; and because the course was between the north and east, it is N. 43° 11′ easterly, or nearly N. E. by N. three quarters easterly.

2. For the departure W X, the proportion will be;

As radius = 90°	- - - -	= 10.0000000
To the distance V X = 96	- - -	= 1.9822712
So is the sine of the course, or angle V = 43° 11′	-	= 9.8352688
To the departure W X = 65.7	- - -	= 1.8175400

Case IV. Both latitudes and departure being given, to find the course and distance.

Example: Suppose a ship, in the latitude 2° S. sails between the south and east, till her difference of latitude be 2° 10′, and her departure 96 miles east; required her direct course and distance?

Geometrically: Let *a* *(ibid.)* be the first place of the ship, on the chart; draw the meridian *a b*, setting off on it 130 miles, the difference of latitude from *a* to *b*, and erect the perpendicular *b c*, making it = 96 miles, the departure from the meridian; through the points *a* and *c*, draw a right line, and the triangle is constructed; and the angle *a*, may be measured by the line of chords, and the distance *a c*, by applying it to the graduated lines on the chart.

Arithmetically: 1. To find the course, the proportion will be;

As *a b* the difference of latitude = 130 - -	= 2.1139434
To radius = 90° - - - -	= 10.0000000
So is *b c* the departure = 96 - - -	= 1.9822712
To the T. of the angle *a*, the courſe required, = 36° 27′	= 9.8683278

Which, becauſe ſhe ſailed between the ſouth and eaſt, is S. 36° 27′ eaſterly, or almoſt S. E. by S. one quarter eaſterly.

2. To find the diſtance ſailed, the proportion will be;

As the ſine of the courſe, or angle *a* = 36° 27′ -	= 9.7738749
To the departure *b c* = 96 - - - -	= 1.9822712
So is radius = 90° - - - -	= 10.0000000
To *a c* the diſtance ſailed = 161.5 - - -	= 2.2083963

Caſe V. One latitude, diſtance, and departure being given, to find the other latitude and courſe ſteered.

Example: A ſhip at ſea, in the latitude of 1° N. ſails between the north and eaſt 120 miles, having departed to the eaſtward of her former meridian 96 miles; required her direct courſe, and the difference of latitude?

Geometrically: Let *d (ibid.)* be the place of the ſhip; draw the meridian *de*, and parallel to it, at the diſtance of the departure = 96, the line *fg*; take the diſtance ſailed between the points of the compaſſes, and, ſetting one foot in *d*, with the other croſs the former parallel in *h*, which will be the place the ſhip is arrived at; from the point *h*, let fall the perpendicular *h e*, and draw the right line *d h*; then will *d e* be the difference of latitude, and the angle *d*, the courſe; both which may be meaſured as in the former caſe.

Arithmetically: 1. To find the courſe, the proportion will be;

As *d h* the diſtance ſailed = 120 - - -	= 2.0791812
To radius = 90° - - - -	= 10.0000000
So is *e h*, the departure = 96 - - -	= 1.9822712
To the ſine of the courſe, or angle *d* = 53° 7′ - -	= 9.9030900

That is, N. 53° 7′ eaſterly, or almoſt N. E. three quarters eaſterly.

2. For the difference of latitude the proportion will be;

As radius = 90° - - - -	= 10.0000000
To *dh*, the diſtance ſailed = 120 - - -	= 2.0791812
So is the co-ſine of the courſe = 53° 7′ - -	= 9.7782870
To *d e*, the difference of latitude = 72 - -	= 1.8574682

Caſe VI. One latitude, courſe, and departure being given, to find the other latitude and diſtance ſailed.

Example: Suppoſe a ſhip, in the latitude of 3° 10′ S. ſails N. W. by N. till her departure be 90 miles; required her direct diſtance, and the latitude ſhe is in?

Geometrically: Let *k (ibid.)* be the firſt place of the ſhip; draw the meridian *k l*, and the rhumb line *k m*, forming an angle with the meridian = 33° 45′, the courſe ſteered; at the diſtance of 90 miles, the departure, draw the line *n o*, parallel to *k l*; then will *m* be the place the ſhip is arrived at: from the point *m*, let fall the perpendicular *m l*; then will *k m* be the diſtance, and *k l*, the difference of latitude; both which may be meaſured, by applying them to the graduated lines on the chart.

Arithmetically: 1. To find the diſtance ſailed, the proportion will be;

As the ſine of the courſe, or ∟*k* = 33° 45′ - -	= 9.7447390
To the departure *l m* = 90 - - -	= 1.9542425
So is radius = 90° - - - -	= 10.0000000
To the diſtance *k m* = 162 - - - -	= 2.2095035

2. For the difference of latitude, the proportion will be;

As the tangent of the courſe, or ∟*k* = 33° 45′ -	= 9.8208926
To the departure *l m* = 90 - - -	= 1.9542425
So is the radius = 90° - - -	= 10.0000000
To *l k* the difference of latitude = 134.7 - -	= 2.1293499

This

This method of failing is extremely erroneous in high latitudes, and therefore is only fit to be ufed in the torid zone. However, being very fimple and eafy to be underftood, we have given the feveral cafes of it firft, that the young navigator may be accuftomed to folve problems of this kind, both geometrically and by computation, before he applies himfelf to the following methods; in which we have contented ourfelves to give the feveral cafes, and proportions for folving them by means of logarithmic tables.

For the method of working traverfes, or courfes, fee the article TRAVERSE.

Middle-Latitude Sailing, that method of navigation which is performed without meridional parts, by taking the middle-latitude; which method of failing, tho' not ftrictly true, yet comes very near the truth, as will appear by comparing an example wrought by it, and by Mercator's failing.

The method of taking the middle latitude of two places is this: find the fum of both their latitudes, and half that fum will be the middle latitude required. Thus, the middle latitude of two places, one in 50°, and the other in 17° 10′ N. latitude, will be found to be 33° 35′; for $50^\circ + 17^\circ\ 10' = 67^\circ\ 10'$; and $\frac{67^\circ\ 10'}{2} = 33^\circ\ 35'$.

Cafe I. The latitudes of two places, and their difference of longitude, being given, to find the direct courfe and diftance. Firft, find the departure, by this proportion; as the radius is to the co-fine of the middle parallel of latitude, fo is the difference of longitude to the departure. Then for the courfe, it will be; as the difference of latitude is to the radius, fo is the departure to the tangent of the courfe: and, laftly, for the diftance, we have this proportion; as the radius is to the difference of latitude, fo is the fecant of the courfe to the diftance.

Cafe II. One latitude, courfe, and diftance failed, being given to find the latitude and difference of longitude. Firft, to find the difference of latitude, by cafe I. of Plane-Sailing, the proportion is; as the radius to the diftance, fo is the co-fine of the courfe to the difference of latitude: hence, the latitude come to being known, we have this analogy for finding the departure, *viz.* as the radius is to the diftance, fo is the fine of the courfe to the departure: and, laftly, for the difference of longitude, it will be, by Cafe II. of Parallel-Sailing; as the co-fine of the middle parallel is to the radius, fo is the departure to the minutes of difference of longitude.

Cafe III. Courfe and difference of latitude being given, to find the diftance failed, and difference of longitude. Firft, for the departure, it will be, by Cafe II. of Plain-Sailing; as the radius is to the difference of latitude, fo is the tangent of the courfe to the departure: then for the diftance, by the fame cafe; as the radius to the difference of latitude, fo is the fecant of the courfe to the diftance: and, laftly, for the difference of longitude, the proportion is, by Cafe II. of Parallel-Sailing; as the co-fine of the middle parallel is to the departure, fo is the radius to the minutes of difference of longitude.

Cafe IV. Difference of latitude and diftance failed being given, to find the courfe and difference of longitude. Firft, for the courfe, by Cafe III. of Plain-Sailing, it will be; as the diftance to the radius, fo is the difference of latitude to the co-fine of the courfe: then for the departure, by the fame cafe; as the radius to the diftance, fo is the fine of the courfe to the departure: and, laftly, for finding the difference of longitude, we have by Cafe II. of Parallel-Sailing, this proportion; as the co-fine of the middle parallel to the departure, fo is the radius to the minutes of difference of longitude.

Cafe V. One latitude, courfe, and departure given, to find the difference of latitude, difference of longitude, and diftance failed. Firft, for the diftance, by Cafe VI. of Plain-Sailing we have this analogy, *viz.* as the fine of the courfe to the departure, fo is the radius to the diftance: then for the difference of latitude, by the fame cafe; as the tangent of the courfe to the departure, fo is the radius to the difference of latitude: and, laftly, to find the longitude, by Cafe II. of Parallel-Sailing, we have this proportion, *viz.* as the co-fine of the middle parallel to the departure, fo is the radius to the minutes of difference of longitude.

Cafe VI. Difference of latitude and departure given, to find the courfe, diftance, and difference of longitude. Firft, by Cafe IV. of Plain Sailing, we have this proportion for finding the courfe, *viz.* as the difference of latitude to the departure, fo is the radius to the tangent of the courfe: and by the fame cafe, for finding the diftance; as the radius to the differ-

difference of latitude, fo is the fecant of the courfe to the diftance : and, laftly, by Cafe II. of Parallel-Sailing, we have this proportion for finding the difference of longitude, *viz.* as the co-fine of the middle parallel of latitude to the departure, fo is the radius to the minutes of difference of longitude.

Cafe VII. Diftance and departure given, to find difference of latitude, courfe, and difference of longitude.

Firft, by cafe V. of Plain-Sailing, we have this proportion for finding the courfe; as the diftance to the radius, fo is the departure to the fine of the courfe : and for the difference of latitude, by the fame cafe: as the radius to the diftance, fo is the co fine of the courfe to the difference of latitude : and, laftly, by Cafe II. of Parallel-Sailing, we have this proportion for finding the difference of longitude, *viz.* as the co-fine of the middle parallel to the departure, fo is the radius to the minutes of difference of longitude.

Cafe VIII. Difference of longitude and departure given, to find the difference of latitude, courfe, and diftance failed.

Firft, by Cafe III. of Parallel-Sailing, we have this proportion for finding the latitude come to; as the minutes of difference of longitude to the departure, fo is the radius to the co-fine of the middle parallel: now fince the middle latitude is equal to half the fum of the two latitudes, it follows, that if from double the middle latitude we fubtract any one of the latitudes, the remainder will be the other; whence the difference of latitude being found, we have this proportion for finding the courfe, by Cafe IV. of Plain-Sailing, *viz.* as the difference of latitude to the radius, fo is the departure to the tangent of the courfe : and, laftly, by the fame cafe, we have this analogy for finding the diftance, *viz.* as the radius to the difference of latitude, fo is the fecant of the courfe to the diftance.

Parallel-Sailing, is the art of finding what diftance a fhip fhould run due eaft or weft, in failing from the meridian of one place to that of another given place, in any parallel of latitude.

This method of navigation is generally ufed in conducting a fhip to an ifland, detached from the main land or other iflands. The method of performing it is this: they fail to the parallel of latitude the place is in, keeping a good account, fo as to be certain whether the place is then to the eaftward or weftward; and alfo, if poffible, to know the longitude arrived at; and then they run due weft or eaft, until the fhip comes near the longitude of the given place, where fhe is then fure to make the port required.

The computations in parallel-failing depend on the following proportions, *viz.*

1. As the radius, R, is to the co-fine of the latitude of any parallel, S; fo is the miles of longitude between any two meridians, L, to the diftance, D, of thofe meridians in that parallel.

Demonftration. Let P D F E (plate CLXXXVI. fig. 1. n° 2.) reprefent the fourth part of a fphere, E being the center, P the pole, E D the radius of the equator, A B, *a b*, the two radii of parallels; then are P B D, P C *d*, quadrants of meridians, D *d* an arch of the equator interfected between them, and B C, *bc*, arches of parallels intercepted likewife between them; alfo the arches D B, D *b*, exprefs the latitudes of thefe parallels, refpectively; and P B, P *b*, the complements of thefe latitudes.

Now the circumference of a circle whofe radius is E D, is to the circumference of a circle whofe radius is A B, as E D is to A B; that is, as the radius of the equator to the radius of the parallel, or as the radius to the co-fine of the latitude. But like arches, D *d*, B C, intercepted between the fame two meridians, are in the fame ratio of their circumferences; therefore, an arch of the equator D *d*, is to a like arch B C, in any parallel of latitude, as the radius to the co-fine of the latitude of that parallel. *Q. E. D.*

Hence it is eafy to conftruct a table, fhewing the proportional diminution of the degrees of longitude in every latitude, from the equator to the poles; which the reader will find under the article LONGITUDE.

2. As the co-fine of one latitude, S, is to the co-fine of another latitude, *s*; fo is a given meridional diftance, in the firft parallel D, to a correfponding meridional diftance *d*, in the fecond parallel. This is evident.

And hence arifes the following proportions, *viz.*

R : S : : L : D.
S : R : : D : L.
L : D : : R : S.
S : *s* : : D : *d*.
D : *d* : : S: *s*.

Whereby all the cafes that can happen in this kind of failing, are readily refolved by

by logarithms; as alſo by the table given under the article LONGITUDE.

Example: How far muſt a ſhip ſail upon the parallel of 30° degrees latitude, in order to get one degree of longitude more weſtward?

As radius - - - - - - - - - -	90° =	10.0000000
To the co ſine of the latitude - - - -	30° =	9.9375306
So is 1° of longitude, or 60 miles - - - -	=	1.7781512
To the diſtance to be ſailed, or 51,96 miles - - - -	=	1.7156818

And the like for any other latitude: but this diſtance might have been found by only looking into the table given under the article LONGITUDE.

Mercator's ſailing, that performed by Mercator's chart. See the article CHART.

Thus, let A and D (pl. CLXXXVI. fig. 1. n° 3.) repreſent two places upon the ſurface of the earth; A C being the meridian of A, and A D the rhumb-line between the two places: thro' D draw D B, perpendicular to A C, and this will be the parallel of latitude of the place D: from A ſet off, upon the meridian, the length A C, equal to the meridional, or enlarged difference of latitude; and through C, draw C E, parallel to B D, and meeting A D, produced in E; then A B will be the proper difference of latitude, A C the enlarged difference of latitude, or the difference of latitude according to Mercator's chart, between the places A and D; C E will be the difference of longitude, and B D the departure; alſo A D will be the proper diſtance, A E the enlarged diſtance, or according to Mercator's chart, and the angle B A D, will be the courſe. See MERIDIONAL, LATITUDE, LONGITUDE, &c.

Now ſince in the triangle A C E, B D is parallel to one of its ſides; it is plain the triangles A C E, A B D, will be ſimilar, and conſequently their ſides proportional: and hence ariſe the ſolutions of the ſeveral caſes in this ſailing.

Caſe. I. To find the meridional or enlarged difference of latitude between two places, whoſe latitudes by obſervation are given.

Of this caſe there are three varieties: 1. When one of the places lies on the equator; then the meridional difference of latitude is the ſame with the latitude of the other place, taken from the table of meridional parts. 2. When the two places are on the ſame ſide of the equator; then the meridional difference is found, by ſubtracting the meridional parts, anſwering to the leaſt latitude from thoſe anſwering to the greateſt, and the difference is that required. 3. When the places lie on different ſides of the equator, then the meridional difference of latitude is found by adding together the meridional parts anſwering to each latitude, and the ſum is that required.

Caſe II. To find the direct courſe and diſtance between two places, whoſe latitudes and longitudes are given.

Firſt, for finding the courſe, we have the following proportion, by Caſe IV. of Rectangular Trigonometry, *viz.* as A C, the meridional difference of latitude, is to C E, the difference of longitude; ſo is R, the radius, to T . B A D, the tangent of the courſe. Then to find the diſtance, by Caſe II. of Rectangular Trigonometry, we have this proportion, *viz.* as the radius R, is to A B, the proper difference of latitude; ſo is ſecant ∠ A, the ſecant of the courſe, to A D, the diſtance.

Caſe III. The courſe and diſtance ſailed being given, to find the difference of latitude and difference of longitude.

Firſt, for finding the difference of latitude by Caſe III. of Rectangular Trigonometry, we have this proportion, *viz.* as the radius is to the diſtance, ſo is the co-ſine of the courſe to the proper difference of latitude: and hence, it will be eaſy to find the meridional difference of latitude; and to find the difference of longitude, the proportion is; as the radius to the meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude.

Caſe IV. Both latitudes, *viz.* that ſailed from and come to, being given; to find the diſtance ſailed, and the difference of longitude.

Firſt, for the difference of longitude, the proportion will be; as the radius is to the enlarged or meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude. Then for the direct diſtance, the proportion is; as the radius to the proper difference of latitude, ſo is the ſecant of the courſe to the direct diſtance.

Caſe V. Both latitude and diſtance ſailed being given, to find the direct courſe and difference of longitude.

Firſt, for finding the angle of the courſe, the proportion is; as the proper difference of

of latitude is to the radius, ſo is the diſtance ſailed to the ſecant of the courſe: then, for the difference of longitude, it will be; as the radius to the meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude.

Caſe VI. One latitude, courſe, and difference of longitude being given: to find the other latitude, and diſtance ſailed.

Firſt, ſay; as the tangent of the courſe is to the radius, ſo is the minutes of difference of longitude to the enlarged difference of latitude; whence, by Caſe I. the minutes of difference of latitude may be found: then to find the direct diſtance, ſay; as the radius is to the proper difference of latitude, ſo is the ſecant of the courſe to the direct diſtance.

Caſe VII. One latitude, courſe, and departure being given; to find the other latitude, diſtance ſailed, and difference of longitude.

Firſt for the diſtance, the proportion is; as the ſine of the courſe is to the departure, ſo is the radius to the direct diſtance: then, for finding the proper difference of latitude, we have this analogy, *viz.* as the tangent of the courſe is to the departure, ſo is the radius to the proper difference of latitude: next, to find the difference of longitude, ſay; as the radius is to the meridional difference of latitude, ſo is the tangent of the courſe to the minutes of difference of longitude.

Caſe VIII. Both latitudes and departure being given, to find the courſe, diſtance, and difference of longitude.

Firſt, for the difference of longitude, the proportion is; as the proper difference of latitude is to the departure, ſo is the enlarged difference of latitude to the minutes of difference of longitude: next, for the courſe, it will be; as the proper difference of latitude is to the departure, ſo is the radius to the tangent of the courſe: and, laſtly, to find the diſtance, we have this analogy; as the ſine of the courſe is to the departure, ſo is the radius to the direct diſtance.

Caſe IX. One latitude, diſtance ſailed, and departure being given; to find the other latitude, difference of longitude, and courſe.

Firſt, for the courſe, ſay; as the diſtance is to the radius, ſo is the departure to the ſine of the courſe: next, for the difference of latitude, the proportion will be; as the radius to the diſtance, ſo is the coſine of the courſe to the difference of latitude; whence the meridional difference of latitude may be found: laſtly, to find the difference of longitude, ſay, as the proper difference of latitude is to the departure, ſo is the enlarged or meridional difference of latitude to the minutes of difference of longitude.

From what has been ſaid, it will be eaſy to ſolve a traverſe, by Mercator's ſailing. See TRIGONOMETRY and TRAVERSE.

Great-circle Sailing. See SAILING.

NAVIS, *argo navis*, or the ſhip Argo, in aſtronomy. See the article ARGO.

NAUMACHIA, in antiquity, a ſhew or ſpectacle among the antient Romans, repreſenting a ſea-fight.

NAUMBURG, a city of Germany, the capital of the county of Sax Naumburg, in Upper Saxony, ſituated in eaſt long. 12°, north lat. 51° 15′.

NAUSEA, in medicine, a reaching, or propenſity and endeavour to vomit, ariſing from a loathing of food, excited by ſome viſcous humour that irritates the ſtomach.

In this diſorder the patient is ſo far from deſiring aliment, that he rather loaths it. It either proceeds from a fault in the ſtomach, or elſe is derived from other diſeaſes, or is a ſymptom thereof, particularly acute inflammations, aſthma, dropſy, hypochondriac paſſion, &c. or when the humours are corrupted, and the ſpirits ſuppreſſed, in malignant diſeaſes. Vomiting in this caſe is proper, or purging when that is forbid. To theſe ſhould be joined ſtrengtheners of the ſtomach, and chiefly ſtomachic balſams, made of oil of nutmegs, and diſtilled oils, and ſtomachic plaſters. Hoffman ſays, that there is nothing better than mint, its ſpirituous water, and diſtilled oil; likewiſe maſtic and its ſpirit, or balſam of Peru diſtilled with ſalt of tartar. In acute fevers, eſpecially the malignant, epidemic, and ſpotted, there is generally a nauſea and reaching to vomit, for which reaſon emetics are good: likewiſe in the dyſentry, eſpecially when it is epidemic in a camp, emetics are not only uſeful, but neceſſary, with a ſlender diet. See EMETIC, FEVER, &c.

NAUTICAL PLANISPHERE, a deſcription of the terreſtrial globe upon a plane for the uſe of mariners, more uſually called chart. See the article CHART.

NAUTICAL COMPASS, the ſame with mariners-compaſs. See COMPASS.

NAUTICUS, in anatomy, is the name of a

a muscle, called also tibialis posticus. See the article TIBIALIS.

NAUTILUS, in natural history, a simple shell, having no hinge, formed of one continued piece, rolled as it were into a spiral form, and having its cavity divided into a great number of cells by transverse partitions, each of which has a perforation, and is continuous to the others, by means of a syphunculus carried the whole length of the shell. The animal inhabiting this shell is a sepia.

Of the nautili, some are thick, and strong; others, thin, light, and brittle; some are aurated, others are not so; and some are smooth on the external surface, and others furrowed.

NAVY, the fleet or shipping of a prince or state. See the article FLEET.

The management of the british navy royal, under the lord high admiral of Great Britain, is entrusted to principal officers and commissioners of the navy, who hold their places by patent. The principal officers of the navy are four, *viz.* the treasurer, whose business it is to receive money out of the exchequer, and to pay all the charges of the navy, by warrant from the principal officers: comptroller, who attends and comptrols all payment of wages, is to know the rates of stores, to examine and audite all accounts, *&c.* surveyor, who is to know the states of all stores, and see wants supplied, to estimate repairs, charge boatswains, *&c.* with what stores they receive, and at the end of each voyage to state and audite accounts: clerk of the acts, whose business it is to record all orders, contracts, bills, warrants, *&c.*

The commissioners of the navy are five: the first executes that part of the comptroller's duty which relates to the comptrolling the victuallers accounts; the second, another part of the said comptroller's duty, relating to the account of the storekeepers of the yard; the third has the direction of the navy at the port of Portsmouth; the fourth has the same, at Chatham; and the fifth, at Plymouth.

There are also other commissioners at large, the number more or less, according to the exigencies of public affairs; and since the increase of the royal navy, these have several clerks under them, with salaries allowed by the king.

The victualling of the royal navy hath formerly been undertaken by contract, but is now managed by commissioners, who hold their office on Tower-hill, London. For the several yards belonging to his majesty's navy, see the article YARD.

The navy-office is where the whole business concerning the navy is managed, by the principal officers and commissioners.

The royal navy of Great Britain is now in a very flourishing state; having been diligently kept up in late reigns, as the natural strength of the kingdom. When it is complete, it is divided into three squadrons, distinguished by the different colours of the flags carried by the respective admirals belonging to the same. See SQUADRON, FLAG, and ADMIRAL.

For the regulation and government of the navy, divers laws have been enacted from time to time; thus, in order to the supplying the navy with men, an act was made, 7 & 8 Will. III. cap. 21. for the registering of seamen, to the number of thirty thousand, for the king's service; every seaman so registered, to be allowed 40 s. *per ann.* bounty-money, whether he was in the service or not, besides his pay for actual service; and it was provided that none but such registered mariners should be capable of preferment to any commission, *&c.* The persons so registred were exempted from serving on juries or in parish offices, as also from service abroad after they were fifty-five years of age; and when they were disabled for future service, they were to be admitted into Greenwich hospital: and the widows of seamen, killed or drowned, were to be taken into the said hospital, and their children educated, *&c.* See HOSPITAL.

As a farther encouragement for entering into the king's service, it was enacted, 1 Geo. II. cap. 19. that if any seamen shall voluntarily enter his name with a commission officer belonging to the navy, to serve and appear on board a ship in fourteen days, *&c.* he shall have the usual conduct-money, and be paid two months advanced wages. When seamen die in the service, tickets shall be made out for their pay, which is to be paid immediately to the executors of the deceased. Bargains and assignments of seamen's pay are declared void; but their tickets for the same may be sold. Persons listed in the navy, shall not be taken thereout by any process at law, unless it be for some crime, or where the debt amounts to 20 l. *&c.*

NAXIA, or NIXIA, one of the islands of the Archipelago, about one hundred miles in circumference, situated in east longit. 26°, and north lat. 36° 30'.

NAZAREANS, in church-hiftory, a name originally given to all chriftians in general, on account that Jefus Chrift was of the city of Nazareth; but afterwards reftrained to a fect of heretics, whofe religion confifted of a ftrange jumble of judaifm and chriftianity; obferving at the fame time the mofaical law, and the feveral rites of the chriftian religion.

NAZARITES, among the Jews, perfons who either of themfelves, or by their parents, were dedicated to the obfervation of nazaritefhip. They were of two forts: namely, fuch as were bound to this obfervance for only a fhort time, as a week or month; or thofe who were bound to it all their lives. All that we find peculiar in the latter's way of life, is, that they were to abftain from wine and all intoxicating liquors, and never to fhave or cut off the hairs of their heads. The firft fort of nazarites were moreover to avoid all defilement; and if they chanced to contract any pollution before the term was expired, they were obliged to begin afrefh. Women as well as men might bind themfelves to this vow.

NE ADMITTAS, in law, a writ directed to the bifhop, at the fuit of one that is patron of a church, where, on a quare impedit, &c. depending, he is doubtful that the bifhop will collate his clerk, or admit the other's clerk, during the fuit between them. This writ fhould be brought within fix months after the church becomes void, and upon granting it, another writ is iffued to the chief juftice of the common pleas, to certify the king in chancery, whether there be any plea before him and the other juftices, between the parties, &c.

NEALED, among feamen, is ufed when the founding is deep water clofe to the fhore, as alfo when the fhore is fandy, clayey, oufey, or foul and rocky ground.

NEALING, or rather ANNEALING. See the article ANNEALING.

NEAP TIDES. See the article TIDES.

NEAPED. When a fhip wants water fo that fhe cannot get out of the harbour, off the ground, or out of the dock, the feamen fay fhe is neaped, or beneaped.

NEAR, or NO NEAR, at fea, a word of command from him that cons the fhip to the man at the helm, requiring him to let her fall to the leeward.

NEAT, or NET WEIGHT, the weight of a commodity alone, clear of the cafk, bag, cafe, or even filth. See WEIGHT.

NEATH a, town of Glamorganfhire, in fouth Wales, fituated on the river Neath, near the Briftol-channel, twenty-eight miles north-weft of Landaff.

NEBEL, in jewifh antiquity, the fame with the pfaltery. See PSALTERY.

NEBULOUS, CLOUDY, in aftronomy, a term applied to certain of the fixed ftars, which fhew a dim hazy light; being lefs than thofe of the fixth magnitude, and therefore fcarce vifible to the naked eye.

NEBULY, or NEBULE'E, in heraldry, is when a coat is charged with feveral little figures, in form of words, running within one another, or when the outline of a bordure, ordinary, &c. is indented or waved, as reprefented in pl. CLXXXVI. fig. 6.

NECESSARIO, in mufic. This word is prefixed to certain parts in mufic, as *a dui violini neceffario, i. e.* that muft be played by two violins. *Canto neceffario* is ufed to fignify much the fame as concertante. See CONCERTANTE.

Every mode has certain chords, which may be called its neceffary or effential chords.

NECESSARY, in a philofophical fenfe, that which cannot but be, or cannot be otherwife. See the next article.

NECESSITY, whatever is done by a neceffary caufe, or a power that is irrefiftible, in which fenfe it ftands oppofed to freedom. See the article FREEDOM.

The fchools diftinguifh a phyfical neceffity, and a moral neceffity; and a fimply abfolute neceffity, and a relative one. Phyfical neceffity is the want of a principle, or of a natural means neceffary to act, which is otherwife called a phyfical or natural impotence. Moral neceffity is only a great difficulty, fuch as that arifing from a long habit, a ftrong inclination, or violent paffion. Simple or abfolute neceffity is that which has no dependence on any ftate or conjuncture, or any particular fituation of things, but is found every where, and in all the circumftances in which the agent can be fuppofed; fuch as in a blind man, the neceffity he is under of not diftinguifhing colours. Relative neceffity, is that which places a man in a real incapacity of acting or not acting in thofe circumftances, and that fituation he is found in, tho' in other circumftances, and in another ftate of things, he might act or not act; fuch, in the opinion of the janfenifts, is the neceffity of doing evil, in a man who with a violent paffion has only a feeble grace to refift it; or the neceffity of

of doing well in a man who having grace of ſeven or eight degrees of ſtrength, has only concupiſcence of two or three degrees to withſtand. All theſe kinds of neceſſity are oppoſite to freedom, or liberty; ſince even in the laſt it is as impoſſible for a man to act or not act, as if he were in a ſtate of abſolute and phyſical neceſſity.

The ſchoolmen admit of other ſpecies of neceſſity, antecedent, concomitant, conſequent, *&c.* Antecedent neceſſity, is that ariſing from an antecedent cauſe neceſſarily operating; ſuch is the neceſſity of the ſun's riſing to-morrow morning. Concomitant neceſſity ariſes from the antecedent and neceſſary cauſe, but depends upon the circumſtances of the effect; the effect all the while being free: thus it is neceſſary Peter ſit, ſuppoſing he is ſitting.

NECK, *collum*, in anatomy, is that ſlender part ſituated between the head and the trunk of the body.

The neck conſiſts of the following parts: 1. the common integuments: 2. ſeven vertebræ: 3. a number of muſcles which ſerve to move the head, the neck, the larynx, the pharynx, and the os hyoides: 4. a number of very large arteries, as the carotids, internal and external, and the vertebral ones: 5. of large veins, as the jugular, internal and external, and the vertebral ones: 6. of large nerves, of the par vagum, the intercoſtals, the recurrent, the diaphragmatics, and the vertebral: 7. a part of the ſpinal marrow: 8. the aſpera arteria, or trachea, particularly the larynx, in which is an eminence called the pomum adami: 9. the pharynx, with a part of the oeſophagus: 10. the thyroide, with ſome other ſmaller glands. See the articles LARYNX, PHARYNX, JUGULAR, *&c.*

Wounds of the NECK. The treatment of theſe wounds ought to be different, according to the different nature of the wound. When the common integuments and muſcular fleſh only are wounded, it will require to be treated in the ſame manner as other ſlight wounds. See the article WOUND.

Where the external jugular is wounded, the methods uſed after bleeding in that vein will be ſufficient. When the internal jugular vein is wounded, the hæmorrhage will be eaſily ſtopped by filling the wound with dry lint, or with the puff-ball or duſty muſhroom; laying over theſe applications ſquare bolſters, and ſecuring all with a bandage drawn as tight as the ſituation of the part will admit. Where this method has no effect, the ſurgeon ſhould make a proper preſſure on the wounded part with his finger, till the hæmorrhage is intirely ſtopped; the dreſſings applied are not to be removed for three days, and then a vulnerary balſam and plaſter is to be applied to heal the wound. In large wounds, or an intire diviſion of the internal jugular, the ſurgeon, if preſent, ſhould make a firm preſſure with his finger on the wounded part, and make inciſions lengthways above the wound, till he can get at the veſſel, and then make a firm ligature upon it, by the aſſiſtance of the crooked needle.

In caſe of a wound in the carotid artery, a ſurgeon, if preſent in time, ſhould uſe the ſame method as in thoſe of the internal jugular vein. This method is more likely to be attended with ſucceſs in wounds of the upper and middle part of the veſſel, than in thoſe of the lower part of it; and where the wound is not in the trunk of the artery, but in one of its branches near the head, you ſhould fill up the wound with lint dipt in ſome ſtyptic liquor, and then cover it up with thick compreſſes, ſecuring all with a tight bandage, and ordering an aſſiſtant to make a preſſure upon the part with his hand, for ſome time after: and in theſe caſes, the dreſſings are not to be removed till the third or fourth day.

In curing the wounds of the aſpera arteria, the ſurgeon ought to clean the wound, and then endeavour to unite the parts by the help of ſticking-plaſters; or where the wound is large, by making two ſtitches with a crooked needle, dreſſing the wounds afterwards in the uſual manner, and enjoining the patient to keep his head in a proper ſituation. The wound thus treated, will eaſily heal, if it has been made either by puncture, or a cutting inſtrument; but if it has been made by a bullet, and any part of the aſpera arteria is carried away, the future is to no purpoſe: wounds of this kind are only to be dreſſed with the vulnerary balſams. If the aſpera arteria is intirely divided, and the lower end of it has ſhrunk into the cavity of the thorax, ſo that it cannot be laid hold on, and united to the upper part, there can be no remedy.

When the oeſophagus is wounded, what is taken in at the mouth comes out through the

the wound, and the patient is ufually affected with hiccoughs and vomiting. When it is entirely divided, there is no remedy; but when it is only perforated, or wounded in part, the cure may be attempted by dreffing it with the vulnerary balfams, endeavouring to unite it by means of fticking-plafters, and enjoining the patient a ftrict abftinence for fome days, giving nourifhing clyfters of broth or milk; but when the neceffities of nature require nourifhment to be taken by the mouth, the wound fhould always be carefully cleaned afterwards, and dreffed daily till it heals.

Wounds of the medulla fpinalis are beft dreffed with balfam of peru, or medicines of the like nature, mixed with a fmall quantity of honey of rofes, fpread upon pledgits, and applied moderately warm. Slight ones of this kind are fometimes healed by this means, but large ones in this part bring on certain death.

Luxation of the NECK. If life remain after fuch an accident, the patient is to be immediately laid flat on the ground or floor; then the furgeon, laying hold of his head, is to extend it ftrongly, gently moving it from fide to fide, till he finds that the neck is reftored to its natural pofture. Mr. Petit mentions another method, by means of flings; but Heifter gives the preference to the former method, both as being more fimple, and becaufe the patient can be relieved much fooner.

Wry NECK, a deformity ufually brought into the world with people; but fometimes it is occafioned by accidents afterwards. When it is from the birth, there is very little reafon to imagine it curable, becaufe the vertebræ of the neck are rendered crooked by that pofture, while the bones are in a foft and pliable ftate.

There are, however, in the writings of furgeons, fome inftances of this diforder, even in thefe circumftances, being cured after twelve, fixteen, or eighteen years.

When this diforder comes on adults, it is occafioned generally either by the contraction of the fkin from a burn on one fide, or from a ftrong fpafmodic contraction of one of the maftoide mufcles; which will at length become fhorter and indurated, by continuing in that pofture; or it may proceed from a relaxation of one or more of thefe mufcles, in confequence of which the neck will be contracted by the ftronger antagonift mufcle on the oppofite fide; or laftly, it may proceed from a preternatural ligament drawing down the head. And when either of thefe is the occafion of the diforder, there is hopes of a cure; efpecially if the patient be young, and the diforder not of long ftanding.

If this diforder be recent, and caufed by a defluxion of humours, evacuating medicines, with mild fudorifics, and heat, may be of fervice. But when it arifes from a contraction of the fkin or mufcles by burning, the repeated ufe of oils, ointments, and fomentations, may relax fo far as to make a cure. A proper firm bandage muft be applied to pull the head toward the natural pofture, and a fteel-collar may be contrived, by which the patient will be fufpended very frequently till the neck recover its proper pofition. But when all thefe fail, the manual affiftance of the furgeon is to be called in. If the fkin is contracted by a burn, it muft be carefully incided tranfverfely in feveral places, and the incifions dreffed fo as to keep them open and dilated, and the head pulled to its proper pofition by a bandage, till the new flefh filling up thefe incifions, gives room for the head to ftand even. But if the wry-neck proceeds from a contraction of one of the maftoide mufcles, or from fome ligament, they are to be divided by a tranfverfe incifion in their lower part, near the clavicle or fternum.

NECKAR, a river of Germany, which rifes in the fouth part of the circle of Swabia, and falls into the Rhine at Manheim.

NECROMANCY, a fpecies of divination, performed by raifing the dead, and extorting anfwers from them. See the article DIVINATION.

NECROSIS, in medicine, a term fometimes ufed for a mortification, or fphacelus. See the article SPHACELUS.

NECTAR, νεκταρ, among antient poets, the drink of the fabulous deities of the heathens, in contradiftinction from their folid food, which was called ambrofia. See the article AMBROSIA.

This word is alfo ufed by fome of the antients to exprefs honey.

NECTARINE, a fruit differing nothing from the common peach, of which it is a fpecies, than in having a fmoother rind and a firmer pulp. See PERSICA.

NECTARIUM, among botanifts, expreffes what is fometimes only a part of the corolla, and fometimes, though more rarely, the whole: it is a part deftined for

for the reception of the honey-juice of the plant, and is very various in its figure; being ſometimes only a hollow in a petal, ſometimes a little ſquama or tubercle, and ſometimes a plain tube.

NECYDALIS, in zoology, a genus of the coleoptera claſs of inſects, the antennæ of which are ſetaceous; the exterior wings are dimidiated, and there are interior or membranaceous ones.

NEEDHAM, a market town of Suffolk, ſituated on the river Orwel, eight miles north-weſt of Ipſwich.

NEEDLE, *acus*, a very common little inſtrument or utenſil, made of ſteel, pointed at one end, and pierced at the other, uſed in ſewing, embroidery, tapeſtry, &c. Needles make a very conſiderable article in commerce, though there is ſcarce any commodity cheaper, the conſumption of them being almoſt incredible. The ſizes are from n° 1. the largeſt, to n° 25. the ſmalleſt. In the manufacture of needles, german and hungarian ſteel are of moſt repute. In the making them, the firſt thing is to paſs the ſteel thro' a coal-fire, and, under a hammer, to bring it out of its ſquare figure into a cylindrical one. This done, it is drawn through a large hole of a wire-drawing-iron, and returned into the fire, and drawn through a ſecond hole of the iron, ſmaller than the firſt, and thus ſucceſſively, from hole to hole, till it has acquired the degree of fineneſs required for that ſpecies of needles, obſerving every time it is to be drawn that it be greaſed over with lard, to render it more manageable. The ſteel thus reduced to a fine wire, is cut in pieces of the length of the needles intended. Theſe pieces are flatted at one end on the anvil, in order to form the head and eye: they are then put into the fire to ſoften them farther, and thence taken out and pierced at each extreme of the flat part on the anvil, by force of a puncheon of well-tempered ſteel, and laid on a leaden block to bring out, with another puncheon, the little piece of ſteel remaining in the eye. The corners are then filed off the ſquare of the heads, and a little cavity filed on each ſide of the flat of the head: this done, the point is formed with a file, and the whole filed over: they are then laid to heat red hot on a long flat narrow iron, crooked at one end, in a charcoal fire, and when taken out hence, are thrown into a baſon of cold water to harden. On this operation a good deal depends; too much heat burns them, and too little leaves them ſoft: the medium is learned by experience. When they are thus hardened, they are laid in an iron-ſhovel on a fire, more or leſs briſk in proportion to the thickneſs of the needles; taking care to move them from time to time. This ſerves to temper them, and take off their brittleneſs: great care here too muſt be taken of the degree of heat. They are then ſtraitened one after another with the hammer, the coldneſs of the water uſed in hardening them having twiſted the greateſt part of them. The next proceſs is the poliſhing them. To do this they take twelve or fifteen thouſand needles, and range them in little heaps againſt each other on a piece of new buckram ſprinkled with emery-duſt. The needles thus diſpoſed, emery-duſt is thrown over them, which is again ſprinkled with oil of olives; at laſt the whole is made up into a roll, well bound at both ends. This roll is then laid on a poliſhing-table, and over it a thick plank loaden with ſtones, which two men work backwards and forwards a day and a half, or two days, ſucceſſively; by which means the roll thus continually agitated by the weight and motion of the plank over it, the needles withinſide being rubbed againſt each other with oil and emery, are inſenſibly poliſhed. After poliſhing they are taken out, and the filth waſhed off them with hot water and ſoap: they are then wiped in hot bran, a little moiſtened, placed with the needles in a round box, ſuſpended in the air by a cord, which is kept ſtirring till the bran and needles be dry. The needles thus wiped in two or three different brans, are taken out and put in wooden veſſels, to have the good ſeparated from thoſe whoſe points or eyes have been broke either in poliſhing or wiping: the points are then all turned the ſame way, and ſmoothed with an emery-ſtone turned with a wheel. This operation finiſhes them, and there remains nothing but to make them into packets of two hundred and fifty each.

Needles the dozen thouſand pay, on importation, 11 s. 6$\frac{60}{100}$d. and, on exportation, draw back 10 s. 1$\frac{50}{100}$d. Pack-needles the thouſand pay, on importation, 2 s. 6$\frac{80}{100}$d. and draw back, on exportation, 2 s. 3 d. Sail-needles the thouſand pay, on importation, 1 s. 3$\frac{40}{100}$d. and draw back, on exportation, 1s. 1$\frac{60}{100}$d.

Chirurgeon's NEEDLE. There are many caſes wherein the uſe of the needle is highly

highly neceſſary; in ſome of which a cure cannot be completed without it, as in wounds of the belly, and in divided tendons. In amputations they are found much preferable to the actual cautery; and in the operation of the aneuriſm, bubonocele, lithotomy, *&c.* they very much forward the cure; and in a cataract and hare-lip, the cure is wholly performed by them; for a deſcription of the different needles uſed in the cure of each of theſe two laſt diſorders, ſee the articles COUCHING and HARE-LIP.

Chirurgical needles are of different figures and ſizes; being ſtraight, crooked and flat; and all of them very ſharp, and moſtly made of well-tempered metal: thoſe needles uſed for ſetons, and generally for the ſuture of tendons, and for the ſewing up of dead bodies, muſt be ſtraight. In amputation, and all other ſort of wounds, the crooked ſort are uſed. Mr. Monro, in the Medical Eſſays, obſerves, that needles of ſilver pierce more eaſily in ſtitching arteries after amputation, than thoſe made of ſteel. See the article LITHOTOMY.

Magnetical NEEDLE, in navigation, a needle touched with a loadſtone, and ſuſtained on a pivot or center; on which playing at liberty, it directs itſelf to certain points in or under the horizon; whence the magnetical needle is of two kinds, *viz.* horizontal and inclinatory. See the article MAGNET.

Horizontal needles are thoſe equally balanced on each ſide the pivot that ſuſtains them; and which, playing horizontally with their two extremes, point out the north and ſouth points of the horizon. For their application and uſe, ſee the article COMPASS.

In the conſtruction of the horizontal needle a piece of pure ſteel is provided, of a length not exceeding ſix inches, leſt its weight impede its volubility, very thin, to take its verticity the better, and not pierced with any holes, or the like, for ornament ſake, which prevent the equable diffuſion of the magnetic virtue. A perforation is then made in the middle of its length, and a braſs-cap or head ſoldered on, whoſe inner cavity is conical, ſo as to play freely on a ſtyle or pivot headed with a fine ſteel-point. The north point of the needle in our hemiſphere is made a little lighter than the ſouthern; the touch always deſtroying the balance, if well adjuſted before, and rendering the north end heavier than the ſouth, and thus occaſioning the needle to dip.

The method of giving the needle its verticity or directive faculty, has been ſhewn already under the article MAGNET; but if after touching, the needle be out of its equilibrium, ſomething muſt be filed off from the heavier ſide, till it balance evenly.

Needles in ſea-compaſſes are uſually made of a rhomboidal or oblong form: we have given their ſtructure already under the article COMPASS.

The needle is not found to point preciſely to the north except in very few places, but deviates from it more or leſs in different places, and that too at different times, which deviation is called its declination or variation from the meridian. See the article VARIATION.

Inclinatory or dipping-needle, a magnetical needle ſo hung as that inſtead of playing horizontally and pointing out north and ſouth, one end dips or inclines to the horizon, and the other points to a certain degree of elevation above it. Or a dipping-needle may be defined, with Mr. Whiſton, to be a long ſtraight piece of ſteel (plate CLXXXVI. fig. 2.) every way poiſed on its center, and afterwards touched with a loadſtone, but ſo contrived as not to play on the point of a pin, as does the common horizontal needle, but to ſwing in a vertical plane, about an axis parallel to the horizon; and this to diſcover the exact tendency of the power of magnetiſm.

The inventor of the dipping-needle, Mr. Whiſton obſerves, was without all queſtion one Robert Norman, a compaſs-maker at Wapping in London; who having had a cuſtom of finiſhing and hanging the needles of his compaſſes before he touched them, always found that immediately after the touch, the north point would bend or decline downward under the horizon, inſomuch that to balance the needle again, he was always forced to put a piece of wax on the ſouth end, as a counterpoiſe. The conſtancy of this effect led him at length to obſerve the preciſe quantity of the dip, or to meaſure the greateſt angle the needle would make with the horizon. This, in the year 1576, he found at London to be 71° 50′; but the dip varies as well as the horizontal direction, and is now found at the ſame place to be about 75°. Burrows, Gilbert, Ridley, Band, *&c.* endeavour to apply this diſcovery of the dip to the finding

finding of the latitude; and the laſt author going further, likewiſe propoſed the finding of the longitude thereby, but for want of obſervations and experiments, he could go no length. The late Mr. Whiſton being furniſhed with the further obſervations of colonel Windham, Dr. Halley, Mr. Pound, Mr. Cunningham, Pere Noel, Pere Feuillee, and his own, improved very much upon this doctrine and uſe of the dipping-needle, brought it into more certain rules, and endeavoured in good earneſt to find the longitude thereby. In order to this he obſerves, 1. That the true tendency of the north or ſouth end of every magnetic needle is not to that point in the horizon to which the horizontal needle points, but towards another directly under it in the ſame vertical; and in different degrees under it in different ages, and in different places. 2. That the power by which a horizontal needle is governed, and all our navigation ordinarily directed, is proved to be but one quarter of the power by which the dipping-needle is moved, which ſhould render the latter far the more effectual and accurate inſtrument. 3. That a dipping needle a foot long, will plainly ſhew an alteration of the angle of inclination in thoſe parts of the world in half a quarter of a degree, or $7\frac{1}{2}$ geographical miles: *i. e.* ſuppoſing that diſtance taken along or near a meridian. And a needle of four feet, in two or three miles. 4. A dipping-needle four feet long in theſe parts of the world, will ſhew an equal alteration along a parallel, as one of a foot long will ſhew along a meridian: *i. e.* this will with equal exactneſs ſhew the longitude, as that the latitude. This depends on the poſition of the lines of equal dip in theſe parts of the world, which are found to be about fourteen or fifteen degrees from the parallels. Hence he argues, that as we can have needles of five, ſix, ſeven, eight or more feet long, which will move with ſtrength ſufficient for exact obſervation, and ſince microſcopes may be applied to the viewing the ſmalleſt diviſions of degrees on the limb of the inſtrument, it is evident that the longitude at land may be found thereby to leſs than four miles; and as there has been many obſervations made at ſea with the ſame inſtrument by Noel, Feuillee, &c. which have determined the dip uſually within a degree, ſometimes within $\frac{1}{2}$ or $\frac{1}{3}$ of a degree, and this with ſmall needles of five or ſix or at the moſt nine inches long, it is evident the longitude may be found even at ſea to leſs than half a quarter of a degree.' This much premiſed, the obſervation itſelf follows.

To find the longitude or latitude by the dipping-needle. If the lines of equal dip below the horizon be drawn on maps or ſea-charts from good obſervations, it will be eaſy from the longitude known, to find the latitude, and from the latitude known, to find the longitude either at ſea or land.

Suppoſe, for example, you were travelling or ſailing along the meridian of London, and found the angle of dip with a needle of one foot to be 75°, the chart will ſhew that this meridian and the line of dip meet in the latitude 53° 11′, which therefore is the latitude ſought. See the article LATITUDE.

Or ſuppoſe you were travelling or ſailing along the parallel of London, that is in 51° 32′ north latitude, and you find the angle of dip to be 74°. The parallel and the line of this dip will meet in the map in 1° 46′ of eaſt longitude from London, which is therefore the longitude ſought. See the article LONGITUDE.

About the year 1700, Dr. Halley publiſhed a ſea-chart, on which the lines of variation are delineated: but as experience has ſhewn, that the variation is in a perpetual ſtate of fluctuation, at leaſt in the greateſt part of the world, it is therefore neceſſary that the lines of variation be often corrected. About the year 1744, Mr. Montaine and Mr. Dodſon found, on a careful examination, that the variation lines conſtructed by Dr. Halley were become entirely uſeleſs; and that, in order to render this chart uſeful to the mariner, it was neceſſary to conſtruct a new ſyſtem of theſe lines, or ſomething analogous to them every ten or twelve years at leaſt; accordingly, about the year 1744, they republiſhed Dr. Halley's chart with new variation lines. In 1755, they made a new conſtruction; thoſe of 1744 being become erroneous by time; and in 1759, they publiſhed an account of the methods uſed to deſcribe lines on Dr. Halley's chart, ſhewing the variation of the magnetic needle, about the year 1756, in all the known ſeas, and the application and uſe of theſe lines in correcting the longitude at ſea.

As the mutation of the magnetical variation is remarkably irregular in different parts of the world, the only method of conſtructing a variation chart, is by collecting

lecting a large number of obfervations made by artifts in their voyages, and transferring them to the chart, which was the method thefe gentlemen purfued.

In 1755, was publifhed a table of the quantity of variation, from the year 1660 to 1860, at feveral places, computed, after many years intenfe application, by Mr. Williams, who was perfuaded he had difcovered a method of calculating the variation at any given place and time.

NEEDLE-FISH, a fpecies of fyngnathus, with the middle of the body hexangular, and the tail pinnated. See the article SYNGNATHUS.

The males and females of this fpecies, as well as of the fea-adder, another fpecies of the fyngnathus, are eafily diftinguifhed; the females carrying a kind of long bag, reaching from the anus halfway to the tail; there are numerous eggs in this, at the proper feafon they are full, of the fize of rape-feed, and of a whitifh colour; they neither are fo numerous, nor at all refemble in their arrangement or difpofition the eggs of the generality of the other fifhes of this clafs; this may indeed be in fome degree faid to be viviparous, for the rudiment of the fœtus is in fome meafure animated before it is difcharged from the vefica or bag.

NEEDLE-SHELL, in natural hiftory, the flender turbo, with ventricofe fpires, and a fmall round mouth. See TURBO.

NEEDLES, two capes, or head-lands, at the weft end of the ifle of Wight, which is very difficult to pafs on account of the fands and rocks.

NE EXEAT REGNUM, or more properly, NE EXEAT REGNO, in law, a writ for reftraining a perfon from going out of the kingdom, without the king's licence. It may be directed either to the fheriff, to caufe the party to find furety that he will not depart the realm, or to the party himfelf; and in that cafe, if he goes, he is liable to be fined. If a fuit be depending in the court of chancery, and the plaintiff is afraid that the defendant will fly abroad, he may have this writ; in which the defendant muft give bond to the mafter of the Rolls, in the penalty of 1000 l. or fome fuch fum, for fubmitting to the writ, or elfe he muft fatisfy the court, by anfwer, affidavit, or otherwife, that he has no defign of leaving the kingdom, and enter into fecurity accordingly.

NEFASTI DIES, in roman antiquity, an appellation given to fuch days wherein it was not allowed to adminifter juftice, ufually marked in the calender by N. or N. P. *i. e.* nefaftus prima, when only nefaftus for the firft part of it. See FASTI.

NEGAPATAN, a port-town of the hither India, fituated on the coaft of Coromandel: eaft long. 79°, north lat. 11° 15′.

NEGATION, in logic, an act of the mind, affirming one thing to be different from another; as, that the foul is not matter.

NEGATIVE, in general, fomething that implies a negation: thus we fay, negative quantities, negative figns, negative powers, *&c.* See the articles QUANTITY, SIGN, POWER, *&c.*

Our words and ideas, fays Dr. Watts, are fo unhappily linked together, that we can never know which are pofitive, which negative ideas, by the words that exprefs them: for fome pofitive terms denote a negative idea, as dead; and there are both pofitive and negative terms invented to fignify the fame and contrary ideas, as unhappy and miferable. To this may alfo be added, that fome words, which are negative in the original language, feem pofitive in englifh, as *abyfs.* The way therefore to know whether any idea be negative or not, is to confider whether it primarily implies the abfence of any pofitive being, or mode of being; if fo, then it is a negative idea, otherwife a pofitive one.

According to logicians, the only way to prove a negative, is by converting it into an affirmative.

NEGATIVE PREGNANT, a negative that implies or brings forth an affirmative; as where a perfon is impleaded to have done a certain thing on fuch a day, *&c.* and denies the thing generally, without alleging any thing farther; it is a negative pregnant plea, becaufe fuch pleading may neverthelefs imply that he did it in fome fort.

NEGOMBO, a port-town on the weft coaft of the ifle of Ceylon, in the indian ocean, fubject to the Dutch: eaft long. 78°, north lat. 7° 25′.

NEGRAIS, a port-town of Pegu, in the further India, fituated on the weft fide of the bay of Bengal: eaft long. 92° 30′, north lat. 17°.

NEGRIL POINT, the moft wefterly promontory of the ifland of Jamaica.

NEGROES, properly the inhabitants of

Nigritia

Nigritia in Africa, alfo called blacks and moors; but this name is now given to all the blacks.

The origin of the negroes, and the caufe of this remarkable difference from the reft of the human fpecies, has much perplexed the naturalifts: Mr. Boyle has obferved, that it cannot be produced by the heat of the climate: for though the heat of the fun may darken the colour of the fkin, yet experience does not fhew that it is fufficient to produce a true blacknefs, like that of the negroes.

In Africa itfelf, many nations of Æthiopia are not black, nor were there any blacks originally in the Weft-Indies. In many parts of Afia, under the fame parallel with the african region, inhabited by blacks, the people are but tawney. He adds, that there are negroes in Africa beyond the fouthern tropic, and that a river fometimes parts nations, one of which is black and the other only tawney. Dr. Barriere alledges, that the gall of negroes is black, and being mixed with their blood, is depofited between their fkin and fcarf-fkin. However, Dr. Mitchel, of Virginia, in the Philofophical Tranfactions, n° 476, has endeavoured by many learned arguments to prove, that the influence of the fun in hot countries, and the manner of life of their inhabitants, are the remote caufes of the colour of negroes, indians, &c. and indeed it would be a ftrong confirmation of his doctrine, if we could fee any people, originally white, become black and woolly by tranfplantation, or *vice verfa*.

Negroes are brought from Guinea, and other coafts of Africa, and fent into the colonies in America, to cultivate tobacco, fugar, indigo, &c. and in Mexico and Peru, to dig in the mines; and this commerce, which is fcarce defenfible on the foot either of religion or humanity, is now carried on by all the nations that have fettlements in the Weft-Indies. Thofe negroes make the beft flaves, who are brought from Angola, Senegal, Cape Verd, the river Gambia, the kingdoms of Joloffes, Daniel, Galland, &c.

There are various ways of procuring them: fome, to avoid famine, fell themfelves, their wives and children, to their princes, or other great men: others are made prifoners of war; and great numbers are feized in excurfions made for that very purpofe by the petty princes, upon one another's territories, in which it is ufual to fweep away all, without diftinction of age or fex.

NEGRO-CAPE, a promontory of Angola, on the weft coaft of Africa: eaft long. 14°, fouth lat. 17°.

NEGROES-ISLAND, one of the Philippine Iflands, in the Indian Ocean, fubject to Spain; fo called, becaufe moft of the inhabitants are blacks: eaft long. 120°, north lat. 10°.

NEGROLAND, or NIGRITIA, a country of Africa, which lies between 18° weft, and 15° eaft longitude, and between 10° and 20° of north latitude, the great river Niger running through it. It is bounded by Zaara, or the defart, on the north; by unknown countries on the eaft; by Guinea, on the fouth; and by the Atlantic Ocean on the weft.

NEGROPONT, or EGRIPOS, the capital of the ifland of Negropont, antiently called Euboea, fituated in the Archipelago, on the weft fide of the ifland; where the ftrait is fo narrow, that it is joined to the continent by a bridge: eaft long. 24° 30′, north lat. 38° 30′.

NEHEMIAH, a canonical book of the Old Teftament, fo called from the name of its author. Nehemiah was born at Babylon, during the captivity, and fucceeded Ezra in the government of Judah and Jerufalem. He was a Jew, and was promoted to the office of cup-bearer to Artaxerxes Longimanus, king of Perfia; when the opportunities he had of being daily in the king's prefence, together with the favour of Efther the queen, procured him the favour of being authorized to repair and fortify the city of Jerufalem, in the fame manner as it was before its deftruction by the Babylonians. On his going to Jerufalem, he finifhed the rebuilding of the walls in fifty-two days, and dedicated the gates of the city with great folemnity. He then reformed fome abufes which had crept in among his countrymen, particularly the extortion of the ufurers, by which the poor were fo oppreffed as to be forced to fell their lands and children for fupport: after which he returned to Perfia, and came back again with a new commiffion, by virtue of which he regulated every thing relating both to the ftate and religion of the Jews. The hiftory of thefe tranfactions is the fubject of this book.

NEIF, *nativa*, in law-books, denotes a fhe-villain. See the article VILLAIN.

NE INJUSTE VEXES, in law, a writ that lies for a tenant, who is diftrained by his

his lord for more services than he is obliged to perform; being a prohibition to the lord, not to distrain, or vex, his tenant.

NEISSE, a town of Silesia, situated on a river of the same name, forty-three miles south of Breslaw.

NEIVA, a river of Muscovy, on which the capital city of Petersburg stands, which falls into the gulph of Finland.

NELLENBURG, a city of Swabia, in Germany, capital of a county of the same name, situated fifteen miles north of Constance.

NELSON'S FORT, a fort and settlement on the west side of Hudson's Bay: west long. 91°, north lat. 57°.

NEMÆA, a town in the Morea, thirty miles south of Corinth, where the antient nemæan games were celebrated.

NEMÆAN GAMES, were so called from Nemæa, a village between the cities of Cleonæ and Philus, where they were celebrated every third year. The exercises were chariot-races, and all the parts of the pentathlum. These games were instituted in memory of Opheltes, or Archemorus, the son of Euphetes and Creusa, and nursed by Hypsipyle; who leaving him in a meadow, while she went to shew the besiegers of Thebes a fountain, at her return found him dead, and a serpent twined about his neck: whence the fountain, before called Langia, was named Archemorus; and the captains, to comfort Hypsipyle, instituted these games. Others ascribe their institution to Hercules, after his victory over the nemæan lion.

NEMINE CONTRADICENTE, *none contradicting it*, a term chiefly used in parliament when any thing is carried without opposition.

NEMOURS, a city in the isle of France, forty-two miles south of Paris: east long. 2° 45′, north lat. 48° 17′.

NENIA, or NÆNIA, in antient poetry, a mournful kind of song, filled with the praises of some deceased person, and sung during the celebration of the funeral. See the article FUNERAL.

NEOMENIA, or NOUMENIA, a festival of the antient Greeks, at the beginning of every lunar month, which was, as the name imports, observed upon the day of the new moon, in honour of all the gods, but especially Apollo, who was called Neomenios; because the sun is the fountain of light, and whatever distinction of times and seasons may be taken from other planets, yet they are all owing to him as the original of those borrowed rays by which they shine.

The games and public entertainments at these festivals, were made by the rich, to whose tables the poor flocked in great numbers. The Athenians at these times offered solemn prayers and sacrifices for the prosperity of their country during the ensuing month. See the article GAMES.

The Jews had also their neomenia, or feast of the new moon, on which peculiar sacrifices were appointed, and on this day they had a sort of family entertainment and rejoicing. The most celebrated neomenia of all others was that at the beginning of the civil year, or first day of the month Tisri, on which no servile labour was performed: they then offered particular burnt-sacrifices, and sounded the trumpets of the temple. The modern jews keep the neomenia only as a feast of devotion, which any one may observe or not as he pleases.

NEOPHYTES, new plants, a name given by the antient Christians to those heathens who had newly embraced the faith; such persons being considered as regenerated, or born anew by baptism. The term neophytes has been also used for new priests, or those just admitted into orders, and sometimes for the novices in monasteries. It is still applied to the converts made by the missionaries among the Infidels.

NEOTTIA, BIRD'S NEST, in botany, a genus of the gynandria diandria class of plants, the flower of which consists of five ovato-oblong petals, connivent at the points: the nectarium is undivided, equal in length to the petals, and furnished with a denticulation on each side; the fruit is a rugose, oblong, capsule, containing a great number of seeds.

NEPA, the lesser furz, in botany, a species of genista spartium.

NEPA, the WATER SCORPION, in zoology, a genus of four winged insects, the rostrum whereof is inflected, the antennæ formed into a kind of claws; the wings cruciated, and the legs four in number. This is a large insect, near an inch in length, and about half its length in breadth; its body is of a kind of elliptic form, very flat and thin, and its tail long and pointed; the body is composed of several joints, and the anus is remarkably large.

NEPENTHES, in botany, a plant of the gynandria-tetrandria clafs, without any flower petals: the fruit is an oblong, columnar, truncated capfule, containing numerous feeds.

NEPENTHES, νηπενθης, is alfo a medicine, mentioned by Homer, as moft efficacious againft grief and forrow: he fays, that whoever fhould take it mixed with wine, could not be fenfible of grief for that whole day, though his father or mother were to die.

NEPER's RODS, or BONES, an inftrument invented by J. Neper, baron of Merchifton, in Scotland, whereby the multiplication and divifion of large numbers are much facilitated.

As to the conftruction of NEPER'S RODS: fuppofe the common table of multiplication to be made upon a plate of metal, ivory, or pafte-board, and then conceive the feveral columns (ftanding downwards from the digits on the head) to be cut afunder; and thefe are what we call Neper's rods for multiplication. But then there muft be a good number of each; for as many times as any figure is in the multiplicand, fo many rods of that fpecies (*i. e.* with that figure on the top of it) muft we have; though fix rods of each fpecies will be fufficient for any example in common affairs: there muft alfo be as many rods of o's.

But before we explain the way of ufing thefe rods, there is another thing to be known, *viz.* that the figures on every rod are written in an order different from that in the table. Thus, the little fquare fpace or divifion in which the feveral products of every column are written, is divided into two parts by a line acrofs from the upper angle on the right to the lower on the left; and if the product is a digit, it is fet in the lower divifion; if it has two places, the firft is fet in the lower, and the fecond in the upper divifion; but the fpaces on the top are not divided: alfo there is a rod of digits, not divided, which is called the index rod, and of this we need but one fingle rod. See the figure of all the different rods, and the index, feparate from one another, in plate CLXXXVI. fig. 3. n° 1.

Multiplication by NEPER'S RODS: firft lay down the index rod; then on the right of it fet a rod, whofe top is the figure in the higheft place of the multiplicand: next to this again, fet the rod, whofe top is the next figure of the multiplicand; and fo on in order, to the firft figure. Then is your multiplicand tabulated for all the nine digits; for in the fame line of fquares ftanding againft every figure of the index rod, you have the product of that figure, and therefore you have no more to do but to transfer the products and fum them. But in taking out thefe products from the rods, the order in which the figures ftand obliges you to a very eafy and fmall addition: thus, begin to take out the figure in the lower part, or unit's place, of the fquare of the firft rod on the right: add the figure in the upper part of this rod to that in the lower part of the next, and fo on, which may be done as faft as you can look on them. To make this practice as clear as poffible, take the following example.

Example: To multiply 4768 by 185. Having fet the rods together for the number 4768 (*ibid.* n° 2.) againft 5 in the index, I find this number, by adding according to the rule. - - 23840
Againft 8, this number. - - 38144
Againft 3, this number. - - 14304

Total product. 1835680

To make the ufe of the rods yet more regular and eafy, they are kept in a flat fquare box, whofe breadth is that of ten rods, and the length that of one rod, as thick as to hold fix (or as many as you pleafe) the capacity of the box being divided into ten cells, for the different fpecies of rods. When the rods are put up in the box (each fpecies in its own cell diftinguifhed by the firft figure of the rod fet before it on the face of the box near the top) as much of every rod ftands without the box as fhews the firft figure of that rod: alfo upon one of the flat fides without and near the edge, upon the left hand, the index rod is fixed: and along the foot there is a fmall ledge, fo that the rods when applied are laid upon this fide, and fupported by the ledge, which makes the practice very eafy; but in cafe the multiplicand fhould have more than 9 places, that upper face of the box may be made broader. Some make the rods with four different faces, and figures on each for different purpofes.

Divifion by NEPER'S RODS: firft tabulate your divifor; then you have it multiplied by all the digits, out of which you may choofe fuch convenient divifors as will be next lefs to the figures in the dividend, and write the index anfwering in the quotient,

quotient, and ſo continually till the work is done. Thus 2179788 divided by 6123, gives in the quotient 356.

Having tabulated the diviſor, 6123, you ſee that 6123 cannot be had in 2179; therefore take five places, and on the rods find a number that is equal, or next leſs to 21797, which is 18369; that is, 3 times the diviſor, wherefore ſet 3 in the quotient, and ſubſtract 18369 from the figures above, and there will remain 3428; to which add 8, the next figure of the dividend, and ſeek again on the rods for it, or the next leſs, which you will find to be five times; therefore ſet 5 in the quotient, and ſubtract 30615 from 34288, and there will remain 3673; to which add 8, the laſt figure in the dividend, and finding it to be juſt 6 times the diviſor, ſet ſix in the quotient.

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6123)2179788(356
     18369 · ·
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NEPETA, the tall white ſideritis, or catmint, in botany, a genus of the didynamia gymnoſpermia claſs of plants; the corolla whereof conſiſts of a ſingle ringent petal, the tube is cylindric and incurvated, and the limb dehiſcent; the faux is patent, cordated and terminating in two ſhort ſegments; the upper lip is erect, roundiſh and emarginated; the lower one is a roundiſh, concave, large, entire and ſerrated; there is no pericarpium, but the ſeeds, which are roundiſh, and four in number, are contained in the cup.

Catmint has been greatly recommended as an uterine and nervous medicine. The people in the country ſtill frequently uſe it in form of an infuſion for theſe purpoſes, but in the ſhops it is only kept as an ingredient in ſome compoſitions.

NEPHEW, a term relative to uncle and aunt, ſignifying a brother or ſiſter's ſon; who, according to the civil law, is in the third degree of conſanguinity, but according to the canon in the ſecond.

NEPHRITIC, ſomething that relates to the kidneys. See KIDNEYS.

NEPHRITIC STONE, *lapis nephriticus*. See the article LAPIS.

NEPHRITIC WOOD, *lignum nephriticum*, a wood of a very denſe and compact texture, and of a fine grain, brought us from New Spain, in ſmall blocks, in its natural ſtate, and covered with its bark. It is to be choſen of a pale colour, ſound and firm, and ſuch as has not loſt its acrid taſte; but the ſureſt teſt of it is the infuſing it in water: for a piece of it infuſed only half an hour in cold water, gives it a changeable colour, which is blue or yellow, as variouſly held to the light. If the vial it is in be held between the eye and the light, the tincture appears yellow; but if the eye be placed between the light and the vial, it appears blue. We often meet with this wood adulterated with others of the ſame pale colour; but the duſkiſh black hue of the bark, is a ſtriking character of this.

The tree is the coatli of Hernandez. It grows to the height of our pear-tree, and its wood while freſh is much of the ſame texture and colour; the leaves are ſmall and oblong, not exceeding half an inch in length, or a third of an inch in breadth; the flowers are ſmall, and of a pale yellow, and oblong ſhape, ſtanding in ſpikes: the cups they ſtand in are divided into five ſegments at the edge, and are covered with a reddiſh down. This is the beſt deſcription of the tree that can be collected from what has been hitherto written of it; no body having had an opportunity of taking its true characters.

This wood is a very good diuretic, and is ſaid to be of great uſe with the Indians in all diſeaſes of the kidneys and bladder, and in ſuppreſſions of urine, from whatever cauſe. It is alſo recommended in fevers and obſtructions of the viſcera. The way of taking it, among the Indians, is only an infuſion in cold water.

NEPHRITICS, in pharmacy, medicines proper for diſeaſes of the kidneys, eſpecially the ſtone. See STONE.

Such particularly are the roots of althæa, dog's graſs, aſparagus, ſago, pellitory of the wall, mallows, pimpinella, red chickpeaſe, peach-kernels, turpentine, the nephritic ſtone, the nephritic wood, &c. and diuretics. See DIURETICS, &c.

NEPHRITIS, in medicine, an inflammation of the kidneys. See the article INFLAMMATION.

The ſymptoms of the nephritis, according to Boerhaave, are a great inflammatory, pungent, burning pain in the place where the kidneys are ſituated, attended with a fever. The urine is made often, but ſmall in quantity, and very red, or flame-coloured, yet in the higheſt degree of the diſeaſe, watery. There

There is a numbneſs of the thigh, a pain in the groin, and the teſticle of the ſame ſide, a pain in the ilium, bilious vomiting, and continual eructations.

When the inflammation is deep, ſays Hoffman, the fever violent, the burning pain in the loins laſting, the difficulty of making water great, the body very coſtive, the anxiety and ſtraitneſs of the precordia exquiſite, the urine crude and white, and finally when the pain continues to the fourteenth day, the kidney will ſuppurate, which is known from the abatement of the pain, and from the thick, purulent ſediment of the urine. This will ſometimes laſt ſeveral years, till there is nothing left of the kidney but a bag. This is attended with a hectic fever, and the patient before he dies is almoſt reduced to a ſkeleton. If the bag happens to burſt, it brings on a retention of urine, and intolerable pains, which end in death.

When the diſeaſe is favourable, it is cured, according to Boerhaave, by reſolution, or a copious red and thick urine diſcharged at one time; or, by a large flux of blood from the hæmorrhoidal veins, in the beginning of the diſeaſe. It is cured alſo by plentiful bleeding, revulſion, and dilution; and by ſoft emollient, antiphlogiſtic decoctions. Hoffman thinks emollient clyſters without any ſaline or purging ſtimulus, the principal help in this diſeaſe. They may be made of milk, whey, or ſoft water, in which elder and camomile-flowers have been boiled; to which add an ounce or two of ſyrup of marſh-mallows, and a dram of nitre. The body ſhould be kept open with oil of ſweet almonds; and wind in the bowels ſhould be diſcuſſed, for which purpoſe cumin ſeeds made into comfits are proper. When there are convulſions, or exceſſive pains, Boerhaave ſays, that opiates are proper; and that, if the vomiting, a ſymptom of this diſeaſe, is too frequent, warm water ſweetened with honey, is beneficial. The patient ſhould avoid all acrimonious aliment; he ſhould neither lie too hot, nor on his back. By this method likewiſe, a nephritis ariſing from a ſtone in the kidney, or ureters, may be cured. When an abſceſs is formed, the medicines muſt be powerfully maturating and emollient. When the urine appears purulent, they muſt be diuretics of medicated waters, whey, and the like, together with balſamics. In this caſe, Hoffman recommends emulſions of the four cold ſeeds and ſweet almonds: ſome attribute a great virtue to cherry-tree gum diſſolved in whey and water, and taken often. A ſyrup of marſh-mallows is very uſeful; add to theſe the decoction of veronica, ſweetened with honey, mixt with powder of nutmegs.

Arbuthnot ſays, that butter-milk, not very ſour, has been reckoned a great ſecret in ulcers of the kidneys; and that chalybeat waters have been beneficial to ſome: he ſays, that ſpruce-beer is a good balſamic in this caſe, and adviſes ſoft malt-liquors rather than wine. If the diſeaſe ends in a ſchirrus, there will be a palſey, or a lameneſs of the adjacent thigh, ſays Boerhaave, as alſo an incurable evil; whence will proceed a renal tabes. When there is a ſudden remiſſion of the pain, a cold ſweat, a weak intermitting pulſe, hiccoughing, a ſtoppage of urine; or when it is livid, black, full of hairs, fetid, abounding with brown or black caruncles, and a ſudden loſs of ſtrength, there is a mortal gangrene.

NEPHROTOMY, a ſpecies of lithotomy. See the article LITHOTOMY.

NEPOTISM, a term uſed in Italy, in ſpeaking of the authority which the popes nephews and relations have in the adminiſtration of affairs, and of the care the popes take to raiſe and enrich them. Many of the popes have endeavoured to reform the abuſes of nepotiſm, which at preſent is ſaid to be aboliſhed.

NEREIDS, in the pagan theology, ſea-nymphs, daughters of Nereus and Doris. Heſiod reckons up fifty of them; and Homer Ραψ. σ. *v.* 39. *& ſeq.* gives us a liſt and deſcription of thirty nine nereids: Virgil's liſt of the nereids is ſhorter, but diverſified with pretty circumſtances, as may be ſeen *Georg. lib.* iv. *v.* 336 *& ſeq.*

The nereids were eſteemed very handſome, inſomuch that Caſſiope, the wife of Cepheus, king of Ethiopia, having triumphed over all the beauties of the age, and daring to vie with the nereids, they were ſo enraged that they ſent a prodigious ſea-monſter into the country; and to appeaſe them ſhe was commanded by the oracle to expoſe her daughter Andromeda, bound to a rock, to be devoured by the monſter.

In antient monuments the nereids are repreſented riding upon ſea-horſes, ſome-

times with an entire human form, and, at other times, with the tail of a fiſh.

NEREIS, in the hiſtory of ſhell-fiſh, the ſame with the ſtomatia. See STOMATIA.

NEREIS, in the hiſtory of inſects, a genus of inſects of the order of the gymnarthria, the body of which is of a cylindric figure, and the tentacula four in number, but two of them are uſually very ſhort, and often ſcarce perceptible.

NERICIA, a province of Sweden, bounded by Weſtmania, on the north; by Sunderland, on the eaſt; and by Gothland on the ſouth and weſt.

NERIUM, the ROSE BAY, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle infundibuliform petal; the tube is cylindric, and ſhorter than the cup; the limb is very large and divided into five broad, obtuſe, oblique ſegments; the fruit conſiſts of two cylindric, acuminated, long, erect folicles, formed each of one valve, and opening longitudinally; the ſeeds are numerous, oblong, coronated with a downy matter, and placed in an imbricated manner.

NERVES, *nervi*, in anatomy, are cylindrical whitiſh parts, uſually fibroſe in their ſtructure; or compoſed of cluſters of filaments, ariſing from the brain, or rather from its medulla oblongata within the ſkull, and from the ſpinal marrow, and running from thence to every part of the body.

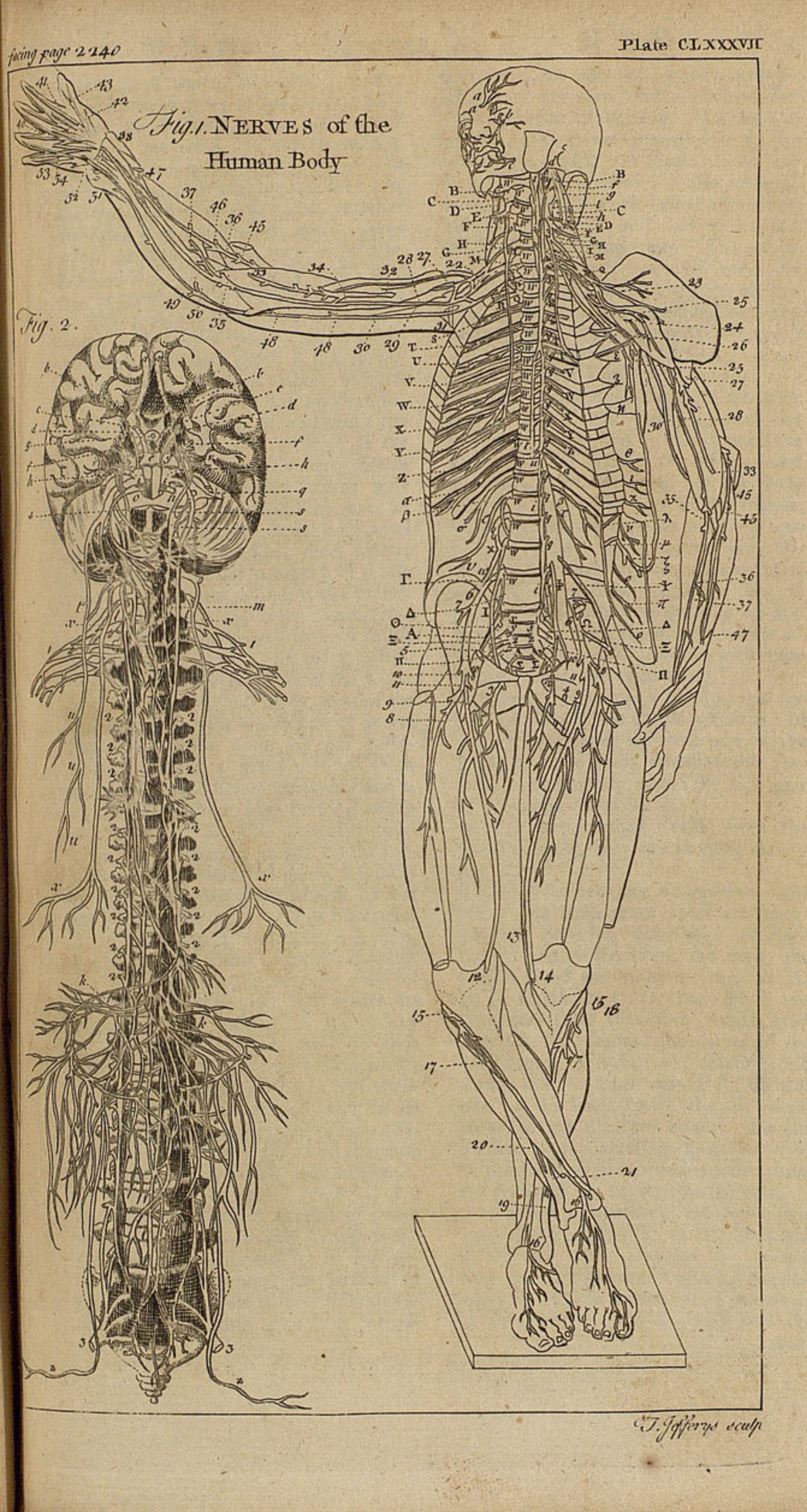
Structure and uſe of the NERVES. This is eaſily perceived in moſt of the larger, and ſome of the ſmaller ones: for beſides the blood-veſſels they receive, and the membranes they are ſurrounded with, they are ſeen to be compoſed of a fibrous matter: or, as it were, of bundles or cluſters of white, cylindrical, and very ſlender filaments; which, on the ſtricteſt examination, appear to be ſolid, and without any cavity. Liewenhoeck indeed affirms, that he had often found a cavity in them; but he is not free from errors in many of his microſcopical obſervations. But though we cannot diſcover any cavity, much leſs a fluid contained in them; yet it is very poſſible that there may be ſuch cavities, and ſuch a fluid, only too ſmall to be perceived by us: and for the actual exiſtence of ſuch a fluid, known by the name of animal ſpirits, many probable arguments are adduced.

The great uſe of the nerves, therefore, though we are not able perfectly to demonſtrate it, ſeems to be to convey to all parts of the body a fluid of an extremely ſubtile kind, ſecreted in the brain and ſpinal marrow, and deſtined for no leſs noble a purpoſe than the ſenſation, motion, and nutrition of the ſeveral parts of the whole human fabric. Thoſe who would enter farther into this ſubject, may conſult Heiſter's Anatomy, Boerhaave's chapter on the brain, in his inſtitutes; Morgagni's Adverſar. where he treats it judiciouſly and deeply; and after theſe, Burggrave on the exiſtence of the animal ſpirits. See alſo the article BRAIN.

The antients found, that by cutting, tying or compreſſing any nerve, or any other way intercepting its communication with the brain, the parts to which it belonged were immediately deprived of all ſenſe and motion. One remarkable inſtance of this is, the making an animal dumb by tying the nerves near the wind-pipe. We read in Galen, of a boy who became quite dumb by having both the recurrent nerves divided. The experiment of cutting theſe nerves in brute animals, was repeated and confirmed by Veſalius; and Dr. Martin aſſures us, he tried it ſucceſsfully on a pig; nor did the animal recover its voice, as ſome have ſuſpected it might. As the voice depends on a proper aperture of the glottis, it ſeems likely that, when the recurrent nerves are cut, the glottis will always ſtand open, and be incapacitated from being ſhut at the will of the animal. An anonymous phyſician offers what he calls an experimentum crucis, in proof of the nerves being compoſed of cylindrical canals, containing a fluid: it is the demonſtration of the optic nerve inflated and dried, which appears canular to the naked eye. See the article EXPERIMENTUM CRUCIS.

Origin, diſtribution, and names of the NERVES. The nerves are uſually divided into two kinds, thoſe which ariſe from the brain, and thoſe ariſing from the ſpinal marrow. See plate CLXXXVII. fig. 1 and 2.

The nerves of the brain are nine pair. 1. The olfactory pair, (*ibid.* fig. 2. *a, a.*) which paſſing through the os cribroſum, are ſpread over the membrane of the noſtrils. 2. The optic pair, (*ibid. b, b.*) which by their expanſion form the retina of the eye. 3. The motary pair of the eyes, (*ibid. c, c.*) each of which is divided, near the orbit, into ſix parts, or branches;


Fig. 1. NERVES of the Human Body
Fig. 2.
T. Jefferys sculp

branches; of which, in human ſubjects, the firſt branch goes to the elevator palpebræ; the ſecond, to the elevator of the eye; the third, to the depreſſor; the fourth, to the adducent; the fifth to the inferior oblique muſcle; and the ſixth, into the tunics of the eye: but, in other animals, they are divided much otherwiſe. 4. The pathetic pair of Willis, *(ibid. d, d.)* which are very ſmall, and run to the trochlear muſcle of the eye. 5. The guſtatory pair, which are very large, and divided within the cranium into three branches, *(ibid. f, f.)* immediately under the dura mater: of theſe the firſt branch, called the ophthalmic, runs to various parts of and about the eye, the eye-lids, the muſcles of the forehead and noſe, and the integuments of the face. The ſecond branch may be called the ſuperior maxillary one, as being finally diſtributed through all parts of the upper jaw, the lips, noſe, palate, uvula, gums, teeth: a branch of it alſo runs to the ear, and joining with a branch of the ſeventh pair, forms the chorda tympani. The third branch may be called the maxillaris inferior, as being diſtributed over the ſeveral parts of the lower jaw, the tongue, and other parts of the mouth; whence the whole pair of nerves has obtained the name of par guſtatorium; though a great part of them ſerves to very different purpoſes, and is carried to parts that have nothing to do with taſting. 6. The abducent pair, *(ibid. g, g.)* except a branch for the formation of the intercoſtal nerve, is wholly carried to the abducent muſcle of the eye; whence its name. The intercoſtal nerve *(ibid.* fig. 1 and 2, *i, i, i, l, m,* &c.) is formed either of ramifications of the two preceding nerves, or only of thoſe of the ſixth pair. It makes its way out of the cranium by the paſſage of the internal carotid, and deſcends near the eighth pair through the neck; and thence through the breaſt and abdomen, even to the pelvis; and in its way, makes various plexuſes and ganglia, and ſends branches to almoſt all the parts contained in the breaſt and abdomen. 7. The auditory pair, *(ibid. h, h.)* ariſe with two trunks; the one of which is called the portio dura, or hard portion; the other the portio mollis, or ſoft portion. This laſt enters the foramen of the os petroſum, and thence through various little apertures gets into the labyrinth of the ear, where it is expanded over all its parts, and conſtitutes the primary organ of hearing. The harder portion, paſſing the aquæduct of Fallopius, ſends back one branch into the cavity of the cranium: it alſo ſends off another branch, which helps to form the chorda tympani; and others to the muſcles of the tympanum. The reſt of this pair goes to the external ear; the pericranium, the muſcles of the os hyoides, the lips, the eye-lids, and the parotids. 8. The par vagum *(ibid. k, k, k.)* with the acceſſorius of Willis, paſs out near the lateral ſinuſes of the dura mater, and, deſcending through the neck and thorax to the abdomen, ſend out branches by the way to the larynx, the pharynx, the heart, the lungs, and eſpecially to the ſtomach. It alſo ſends off from the upper part of the thorax, large branches, which are variouſly implicated in the neck, thorax, and abdomen, with the linguals, the cervicals, and the intercoſtals. 9. The lingual pair go immediately to the tongue, and are called by ſome the motary nerves of the tongue; but by others, with more juſtice, the guſtatory nerves.

We are to obſerve, ſays Heiſter, that the pair of nerves, which the generality of writers have called the tenth pair of the head, are, for many unanſwerable reaſons, to be properly called the firſt pair of nerves of the neck.

Of the nerves which ariſe from the ſpinal marrow, they are properly thirty-two pair.

Thoſe of the neck are no leſs than eight pair; and from them there are innumerable branches diſtributed through the muſcles of the head, the neck, the ſcapula, and the humerus, marked A, B, C, D, *&c.* to O, O, the eighth and laſt pair: from the third, fourth, and fifth pair are formed the nerves of the diaphragm; and the ſixth, ſeventh, and eighth pair, together with P P, the firſt pair of the back, form the ſix robuſt nerves of the arms and hands. To this diviſion is the acceſſory ſpinal nerve of Willis to be referred, which ariſes about the origin of the third or fourth pair.

The nerves of the back are twelve pair marked P P, Q Q, R, S, *&c.* to Z and *α, β, &c.* which, beſides the branch they give to the brachial nerves, run entirely in the ſame furrow along the courſe of the ribs, and are diſperſed over the pleura,

pleura, the intercoſtal, pectoral, and abdominal muſcles, the breaſt, and other parts of the thorax.

The nerves of the loins are five pair, marked τ, φ, ω, Γ, Θ; with their branches, ϑ, χ, ψ, &c. Theſe are in general diſperſed over the loins, the peritonæum, and the integuments and muſcles of the abdomen: and beſides this, their firſt pair often gives, on each ſide, a branch to the diaphragm. The ſecond pair after inoſculating with the branches of the firſt, third, and fourth pair, forms the crural nerves, 6 6, 7 7, 8 8, *&c.* which are diſtributed over the anterior part of the thigh: and in the ſame manner, a branch is formed of the conjunctions of the ſecond, third, and fourth pair, which paſſes through the great foramen of the os pubis to the ſcrotum, the teſticles, and the adjoining parts. The fourth and fifth pair of the nerves of the loins, joining with the firſt, ſecond, third, and fourth pair of the os ſacrum, compoſe the nerve called iſchiatic, which is the largeſt in the body, being marked 3, 3, in fig. 2. it deſcends along the hinder part of the thigh, and its branches are diſtributed over the whole leg, the foot and toes; being marked 15, 17, 18, *&c.*

The nerves of the ſacrum form five or ſix pair, though not always determinately and regularly ſo: they paſs through the foramina of this bone, and the ſuperior ones of them, as already obſerved, compoſe the iſchiatic nerve; and what remains is diſperſed, in a multitude of ramifications, over the parts contained in the pelvis, the inteſtinum rectum, the bladder, the parts of generation, and the parts adjacent. They are marked, in the figure, Λ, Ξ, Π, Σ, *&c.*

We ſhall only add, that 1, 1, fig. 2. repreſent the brachial nerves; 2, 2, *&c.* the communications of the vertebral nerves with the intercoſtals; *l*, *l*, remarkable communications between the phrenic nerves and the intercoſtals; *t*, *u*, *u*, *&c.* the acceſſory nerve of the eighth pair; *x*, *x*, the phrenic nerves; and *z*, *z*, the nerves which go to the teſtes, uterus, *&c.*

Wounds of the NERVES. Upon the diviſion of a nerve, Heiſter obſerves, that the limb to which that nerve was extended becomes inſtantly rigid, void of ſenſation, and withers: ſo that it is no wonder that a man inſtantly expires, upon the diviſion of thoſe nerves which are ſent to the heart or diaphragm; a wound is alſo attended with great danger where the nerve is only partially wounded, and not entirely divided; for the wounded fibres contract themſelves, and thoſe which remain undivided ſuffer too great an extenſion, which will bring on moſt violent pains, ſpaſms, convulſions, inflammations, and gangrenes, and ſometimes death itſelf.

Conſent of the NERVOUS *parts.* See the article CONSENT.

NEST, *nidus.* See the article NIDUS.

NESTORIANS, a chriſtian ſect, the followers of Neſtorius, biſhop and patriarch of Conſtantinople; who, about the year 429, taught that there were two perſons in Jeſus Chriſt, the divine and the human, which are united, not hypoſtatically or ſubſtantially, but in a myſtical manner: whence he concluded, that Mary was the mother of Chriſt and not the mother of God. For this opinion, Neſtorius was condemned and depoſed by the council of Epheſus; and the decree of this council was confirmed by the emperor Theodoſius, who baniſhed the biſhop to a monaſtery.

Thoſe chriſtians who at this day are called neſtorians and chaldeans, are very numerous, and are ſpread over Meſopotamia, and along the river Tigris and Euphrates: they are even got into the Indies, and into Tartary and China. Thoſe of India ſettled there under a neſtorian prieſt called John, who, in the year 1145, got himſelf declared king of Indoſtan, and grew very famous under the name of Preſter John. The neſtorians, though they ſpeak the language of the reſpective countries, only officiate in the chaldee or ſyriac tongue. The neſtorian monks are habited in a black gown tied with a leathern girdle, and wear a blue turban. The nuns are dreſſed much after the ſame manner, excepting that they tie a kind of black veil about their heads and about their chins. They muſt be forty years old before they take the monaſtic habit.

NET, a device for catching fiſh and fowl. See the article FISHERY.

The taking fowls by nets, is the readieſt and moſt advantageous of all others, where numbers are to be taken. The making the nets is very eaſy, and what every true ſportſman ought to be able to do for himſelf. All the neceſſary tools are wooden needles, of which there ſhould be ſeveral of different ſizes, ſome round and others flat: a pair of round-pointed and flat ſciſſars, and a wheel to wind

wind off the thread. The packthread is to be of different ftrength and thicknefs, according to the fort of birds to be taken; and the general fize of the mefhes, if not for very fmall birds, is two inches from point to point. The nets fhould neither be made too deep nor too long, for they are then difficult to manage; and they muft be verged on each fide with twifted thread. The natural colour of the thread is too bright and pale, and is therefore in many cafes to be altered. The moft ufual colour is the ruffet, which is to be obtained by plunging the net after it is made, into a tanner's pit, and letting it lie there till it be fufficiently tinged: this is of a double fervice to the net, fince it preferves the thread as well as alters the colour. The green colour is given by chopping fome green wheat and boiling it in water, and then foaking the net in this green tincture. The yellow colour is given in the fame manner with the decoction of celandine, which gives a pale ftraw-colour, which is the colour of ftubble in the harveft-time. The brown nets are to be ufed on ploughed lands, the green on grafs grounds, and the yellow on ftubble lands.

NETE DIEZEUGMENON, in the antient mufic, one of the chords of the greek fyftem, anfwering to the *E fi mi* of the third octave of the modern. See the article DIAGRAM.

NETE HYPERBOLÆON, in antient mufic, the higheft or moft acute of the chords of the antient diagram, anfwering to the *A mi la* of the third octave of the organ.

NETE SYNEMMENON, in antient mufic, the higheft chord of a tetrachord, or fourth, of the greek fyftem, added to make B flat fall between the *mefe* and *paramefe*, or our A and B, which till then had the interval of a tone-major between them. This chord has the fame found with the paranete diezeugmenon, or our D by B flat. See DIAGRAM.

NETHERLANDS, antiently called Belgia, but fince denominated Low-Countries, or Netherlands, from their low fituation, are fituated between 2 and 7° of eaft longitude, and between 50 and 53° 30′ of north latitude; and are bounded by the german-fea on the north; Germany on the eaft; by Lorrain and France on the fouth; and by another part of France and the britifh feas on the weft; extending near three hundred miles in length from north to fouth, and two hundred miles in breadth from eaft to weft. They confift of feventeen provinces; ten of which are called the auftrian and french Netherlands, and the other feven United-Provinces.

NETTINGS, in a fhip, a fort of grates made of fmall ropes, feized together with rope-yarn or twine, and fixed on the quarters and in the tops; they are fometimes ftretched upon the ledges from the wafte-trees to the roof-trees, from the top of the fore-caftle to the poop; and fometimes are laid in the wafte of a fhip to ferve inftead of gratings.

NETTLE, *urtica*, in botany. See the article URTICA.

The root of the common-nettle is accounted diuretic and lithontriptic: it ferves alfo to purify the blood, and is good in fpittings of blood, hæmorrhages, and the menfes. The feeds of the roman-nettle are recommended in the afthma, and other diforders of the lungs.

Dead NETTLE. See LAMIUM.

NETTLE-TREE, *celtis*. See CELTIS.

NETTUNO, a port-town of Italy, in the Compagna di Roma: fituated on the Mediterranean, thirty miles fouth-eaft of Rome.

NEUENSTAT, a town of Germany, twelve miles north-eaft of Hailbron.

NEVERS, a city of France, capital of the Nivernois: eaft long. 3° 15′, north lat. 46° 50′.

NEUFCHATTEAU, a town of Luxemburg, twenty miles north-eaft of Sedan.

NEUFCHATTEL, the capital of the counties of Neufchattel and Vallengin, in Switzerland, which together form one free and independent ftate, fubject to the king of Pruffia: eaft long. 6° 35′, noth lat. 47° 10′.

NEUFCHATTEL is alfo a town of Normandy, in France, twenty-three miles north-eaft of Rouen.

NEVIN, or NEWIN, a market-town of North-Wales, eighteen miles fouth-weft of Caernarvon.

NEVIS, one of the Caribbee-iflands, divided from the eaft end of St. Chriftophers by a narrow channel.

NEURADA, in botany, a genus of the decandria-monogynia clafs of plants, the flower of which confifts of five equal petals, and its fruit is an orbiculated depreffed capfule, convex on the underpart, and every where armed with afcendent prickles: it contains ten cells, in each of which is a fingle feed.

NEURITICS, in pharmacy, medicines good in diforders of the nerves.

NEUROGRAPHY, fignifies a defcription of the nerves, as neurology does a difcourfe concerning them. See NERVES.

NEUROPTERA, in the hiftory of infects, a name given to that clafs of infects, which have membranaceous wings, with nerves and veins difpofed in a reticulated form in them.

NEUSTAT, a city of Germany, thirty miles fouth of Vienna.

NEUSTAT is alfo a town of lower-Saxony, fixteen miles north-weft of the city of Hanover.

NEUTER, or NEUTER-GENDER, in grammar, one of the three genders of nouns, fo called as being neither mafculine nor feminine. See the article GENDER.

NEUTER-VERBS. See the article VERB.

NEUTRAL-SALTS, among chemifts, a fort or falts neither acid nor alkaline, but partaking of the nature of both. See the articles ACID and ALKALI.

The principal falts of this kind, are common-falt, nitre, aphronitre, the effential falts of plants, and thofe obtained, by boiling, from fome medicinal waters. Such temperate and neutral falts, are both fafeft and moft efficacious in curing many of the diforders incident to mankind. They are known by making no degree of effervefcence, either with acids or alkalies, but become quite faturated upon the affufion of fuch liquors.

NEUTRALITY, the ftate of a perfon or thing that is neuter, or that takes part with neither fide.

NEW-MOON, *neomenia*, ftrictly fpeaking, is the ftate of the moon a little after her conjunction with the fun; though it is often ufed for the conjunction itfelf. See the articles MOON and NEOMENIA.

NEWARK, a borough-town of Nottinghamfhire, fifteen miles north eaft of Nottingham.

It fends two members to parliament.

NEWBOROUGH, a market-town of Anglefey, fifteen miles north-weft of Beaumaris.

NEWBURG, a city of Bavaria, in Germany, twenty-eight miles north-eaft of Augfburg.

NEWBURG is alfo the name of two other towns of Germany; one in Swabia, twenty-five miles weft of Stutgart; and the other, likewife in Swabia, twelve miles north of Bafil.

NEWBURY, a market-town of Berkfhire, fifteen miles weft of Reading.

NEWCASTLE, the county-town of Northumberland, fituated on the river Tine: weft long. 1° 10′, north lat. 55°.

It fends two members to parliament.

NEWCASTLE, a borough-town of Staffordfhire, ten miles north of Stafford. It fends two members to parliament.

NEWCASTLE, a market-town of Carmarthenfhire, in South-Wales, fifteen miles north of Carmarthen.

NEWEL, in architecture, is the upright poft which a pair of winding-ftairs turn about: this is properly a cylinder of ftone which bears on the ground, and is formed by the end of the fteps of the winding-ftairs. There are alfo newels of wood, which are pieces of timber placed perpendicularly, receiving the tenants of the fteps of the wooden-ftairs into their mortices, and on which are fitted the fhafts and refts of the ftair-cafe, and the flights of each ftory.

NEWFIDLERS SEA, a lake thirty-five miles long, on the north-weft part of Upper Hungary.

NEW-FOREST, a part of Hampfhire, oppofite to the Ifle of Wight, appropriated by act of parliament for the growth of oaks to build the royal navy. See the article FOREST.

NEWFOUNDLAND, a triangular ifland, three hundred and fifty miles in length from north to fouth, and two hundred miles in breadth at the bafe, from eaft to weft; fituated in North-America, between 55 and 61° of weft longitude, and between 47 and 52° of north latitude: bounded by the narrow ftreights of Belifle on the north; by the Atlantic-ocean on the eaft and fouth; and by the bay of St. Lawrence on the weft. It is fubject to England; but the fifhing-banks on this coaft are frequented by moft european nations.

NEW-ENGLAND. See ENGLAND.

NEWHAUSEL, a city of Upper Hungary, fituated on the river Neytra: eaft long. 18° 12′, north lat. 48° 25′.

NEWMARK, a city of Tranfilvania, fubject to the houfe of Auftria: eaft long. 23° 25′, north lat. 47° 35′.

NEWMARK is alfo a town of Germany in the palatinate of Bavaria, thirty miles north-weft of Ratifbon.

NEWMARKET, a market-town, fituated both in Cambridgefhire and Suffolk, twelve miles eaft of Cambridge.

NEWNHAM, a market-town, ten miles south-west of Glocester.

NEWPORT, a port-town of Flanders, nine miles south-west of Ostend.

Newport is also a borough town of the Isle of Wight, which sends two members to parliament.

Newport is also a borough of Cornwal, ten miles west of Launceston, which sends two members to parliament.

Newport is also the name of several market-towns; one fifteen miles east of Shrewsbury; another eighteen miles south-west of Monmouth; and a third sixteen miles north-east of St. Davids.

Newport-pagnel, a market-town, sixteen miles north of Ailsbury.

NEWSTAT, the name of several towns; one eight miles north of Landau; another fifteen miles south-west of Ratisbon; a third in Silesia, fifteen miles south of Breslaw; a fourth in Hungary, sixty-five miles east of Tockay; and a fifth in Moravia, ten miles north of Olmutz.

NEWT, or Eft, in zoology. See the articles Eft and Lizard.

NEWTON, a borough-town, thirty-five miles south of Lancaster.

It sends two members to parliament.

Newton is also a borough town in the Isle of Wight, twelve miles south of Southampton: it sends two members to parliament.

NEWTONIAN-PHILOSOPHY, the doctrine of the universe, and particularly of the heavenly bodies; their laws, affections, &c. as delivered by Sir Isaac Newton.

The term Newtonian philosophy is applied very differently by different authors. Some, under this philosophy, include all the corpuscular philosophy, considered as it now stands corrected and reformed by the discoveries and improvements made in the several parts thereof by Sir Isaac Newton. In this sense it is that 's Gravesande calls his Elements of Physics, an Introduction to the Newtonian philosophy; and in this sense, the newtonian is the same with the new philosophy, in opposition to the cartesian, the peripatetic, and the antient corpuscular philosophy. See Cartesian, &c.

Others, by newtonian philosophy, mean the method or order which Sir Isaac observes in philosophizing, *viz.* the reasoning and drawing of conclusions directly from phænomena, exclusive of all previous hypotheses; the beginning from simple principles, deducing the first powers and laws of nature from a few select phænomena, and then applying those laws, &c. to account for other things: and in this sense, the newtonian is the same with the experimental philosophy. See the article Experimental.

Others again, by newtonian philosophy, mean that wherein physical bodies are considered mathematically, and where geometry and mechanics are applied to the solution of phænomena; in which sense, the newtonian is the same with the mechanical and mathematical philosophy. See the article Mechanical.

Others again, by newtonian philosophy, understand that part of physical knowledge which Sir Isaac Newton has handled, improved, and demonstrated in his Principia.

And, lastly, others, by newtonian philosophy, mean the new principles which Sir Isaac has brought into philosophy, the new system founded thereon, and the new solutions of phænomena thence deduced; or that which characterizes and distinguishes his philosophy from all others: and this is the sense, in which we shall chiefly consider it.

As to the history of this philosophy, we have but little to say: it was first made public in 1686, by the author, then a fellow of Trinity-college, Cambridge; and in the year 1713, republished with considerable improvements. Several other authors have since attempted to make it plainer, by setting aside many of the more sublime mathematical researches, and substituting either more obvious reasonings or experiments in lieu thereof; particularly Mr. Whiston, in his Prelect. Phys. Mathem. 's Gravesande, in his Elem. and Inst. and lately, by the learned Comment of Le Seur and Jacquier upon Sir Isaac's Principia.

The philosophy itself is laid down chiefly in the third book of the Principia; the two preceding books being taken up in preparing the way, and laying down such principles of mathematics as have the most relation to philosophy: such are the laws and conditions of powers; and these, to render them less dry and geometrical, the author illustrates by scholia in philosophy, relating chiefly to the density and resistance of bodies, the motion of light and sounds, a vacuum, &c.

In the third book he proceeds to the philosophy itself; and from the same principles deduces the structure of the universe, and the powers of gravity, whereby bodies tend towards the sun and planets; and, from these powers, the motions of the planets and comets, the theory of the moon

moon and the tides. This book, which he calls de Mundi Syftemate, he tells us, was firft wrote in the popular way; but confidering, that fuch as are unacquainted with the faid principles, would not conceive the force of the confequences, nor be induced to lay afide their antient prejudices; for this reafon, and to prevent the thing from being in continual difpute, he digefted the fum of that book into propofitions, in the mathematical manner, fo as it might only come to be read by fuch as had firft confidered the principles; not that it is neceffary a man fhould mafter them all, many of them even the firft rate mathematicians would find a difficulty in getting over. It is enough to have read the definitions, laws of motion, and the three firft fections of the firft book; after which, the author himfelf directs us to pafs on to the book De Syftemate Mundi.

The great principle on which the whole philofophy is founded, is the power of gravity: this principle is not new; Kepler, long ago, hinted it in his Introduct. ad Mot. Martis. He even difcovered fome of the properties thereof, and their effects in the motions of the primary planets; but the glory of bringing it to a phyfical demonftration, was referved to the englifh philofopher. See the article GRAVITATION.

His proof of this principle from phænomena, together with the application of the fame principle to the various other appearances of nature, or the deducing thofe appearances from that principle, conftitute the newtonian fyftem: which, drawn in miniature, will ftand thus:

1. The phænomena are, 1. That the fatellites of jupiter do, by radii drawn to the center of the planet, defcribe areas proportional to their times; and that their periodical times are in a fefquiplicate ratio of their diftances from its center; in which the obfervations of all aftronomers agree. 2. The fame phænomenon holds of the fatellites of faturn, with regard to faturn; and of the moon, with regard to the earth. 3. The periodical times of the primary planets about the fun, are in a fefquiplicate ratio of their mean diftances from the fun. But, 4. The primary planets do not defcribe areas any way proportional to their periodical times, about the earth; as being fometimes feen ftationary, and fometimes retrograde, with regard thereto. See SATELLITE, PERIOD, &c.

2. The powers whereby the fatellites of jupiter are conftantly drawn out of their rectilinear courfe, and retained in their orbits, refpect the center of jupiter, and are reciprocally as the fquares of their diftances from the fame center. 2. The fame holds of the fatellites of faturn, with regard to faturn; of the moon, with regard to the earth; and of the primary planets, with regard to the fun. See the article CENTRAL FORCES.

3. The moon gravitates towards the earth, and by the power of that gravity is retained in her orbit: and the fame holds of the other fatellites with refpect to their primary planets; and of the primaries with refpect to the fun.

As to the moon, the propofition is thus proved: the moon's mean diftance is 60 femidiameters of the earth; her period, with regard to the fixed ftars, is 27 days, 7 hours, 43 minutes; and the earth's circumference 123249600 Paris-feet. Now, fuppofing the moon to have loft all her motion, and to be let drop to the earth, with the power which retains her in her orbit, in the fpace of one minute fhe will fall $15\frac{1}{12}$ Paris-feet; the arch fhe defcribes in her mean motion, at the diftance of 60 diameters of the earth, being the verfed fign of $15\frac{1}{12}$ Paris-feet. Hence, as the power, as it approaches the earth, increafes in a duplicate ratio of the diftance inverfely; fo as at the furface of the earth it is 60×60 greater than at the moon; a body falling with that force in our region muft, in a minute's time, defcribe the fpace of $60 \times 60 \times 15\frac{1}{12}$ Paris-feet, and $15\frac{1}{12}$ Paris-feet in the fpace of one fecond.

But this is the rate at which bodies fall by their gravity at the furface of our earth; as Huygens has demonftrated by experiments with pendulums. Confequently, the power whereby the moon is retained in her orbit, is the very fame we call gravity; for, if they were different, a body, falling with both powers together, would defcend with double the velocity, and in a fecond of time defcribe $30\frac{1}{6}$ feet. See DESCENT and MOON.

As to the other fecondary planets, their phænomena, with refpect to their primary ones, being of the fame kind with thofe of the moon about the earth, it is argued by analogy, they depend on the fame caufes; it being a rule or axiom all philofophers agree to, that effects of the fame kind have the fame caufes. Again, attraction

traction is always mutual, *i. e.* the reaction is equal to the action: consequently the primary planets gravitate towards their secondary ones, the earth towards the moon, and the sun towards them all. And this gravity, with regard to each several planet, is reciprocally as the square of its distance from the center of gravity. See ATTRACTION, &c.

4. All bodies gravitate towards all the planets; and their weight towards any one planet, at equal distances from the center of the planet, is proportional to the quantity of matter in each. See the article WEIGHT.

For the law of the descent of heavy bodies towards the earth, setting aside their unequal retardation from the resistance of the air, is this, that all bodies fall equal spaces in equal times; but the nature of gravity or weight, no doubt, is the same on the other planets as on the earth.

Suppose, *e. gr.* such bodies raised to the surface of the moon, and together with the moon deprived at once of all progressive motion, and dropped towards the earth: it is shewn, that in equal times they will describe equal spaces with the moon; and therefore, that their quantity of matter is to that of the moon, as their weights to its weight.

Add, that since jupiter's satellites revolve in times that are in a sesquiplicate ratio of their distances from the center of jupiter, and consequently at equal distances from jupiter, their accelerating gravities are equal; therefore, falling equal altitudes in equal times, they will describe equal spaces; just as in heavy bodies on our earth. And the same argument will hold of the primary planets with regard to the sun, and the powers whereby unequal bodies are equally accelerated, are as the bodies, *i. e.* the weights are as the quantities of matter in the planets, and the weight of the primary and secondary planets towards the sun, are as the quantities of matter in the planets and satellites. See the article JUPITER.

And hence are several corollaries drawn relating to the weights of bodies on the surface of the earth, magnetism, and the existence of a vacuum. See the articles WEIGHT and MAGNET.

5. Gravity extends itself towards all bodies, and is in proportion to the quantity of matter in each.

That all planets gravitate towards each other, has been already shewn; likewise, that the gravity towards any one, considered apart, is reciprocally as the squares of its distance from the center of the planet; consequently, gravity is proportionable to the matter therein. Further, as all the parts of any planet, A, gravitate towards another planet B; and the gravity of any part is to the gravity of the whole, as the matter of the part to the matter of the whole; and reaction equal to action: the planet B will gravitate towards all the parts of the planet A; and its gravity towards any part will be to its gravity towards the whole, as the matter of the part to the matter of the whole. Hence we derive the methods of finding and comparing weights of bodies towards different planets; of finding the quantity of matter in the several planets, and their densities; since the weights of equal bodies, revolving about planets, are as the diameter of their orbits directly, and as the squares of the periodical times inversely; and the weights at any distance from the center of the planet are greater or less in a duplicate ratio of their distances inversely. And since the quantities of matter in the planets are as their powers at equal distances from their centers: and lastly, since the weights of equal and homogeneous bodies towards homogeneous spheres are, at the surfaces of the spheres, as the diameters of those spheres; and consequently, the densities of heterogeneous bodies are as the weights at the diameters of the spheres.

6. The common center of gravity of the sun, and all the planets is at rest; and the sun, though always in motion, yet never recedes far from the common center of all the planets.

For the matter in the sun being to that in jupiter as 1033 to 1; and jupiter's distance from the sun to the semidiameter of the sun in a ratio somewhat bigger; the common center of gravity of jupiter and the sun will be a point a little without the sun's surface; and by the same means, the common center of saturn and the sun will be a point a little within the sun's surface; and the common center of the earth, and all the planets, will be scarce one diameter of the sun distant from the center thereof: but the center is always at rest; therefore, though the sun will have a motion this and that way, according to the various situations of the planets, yet it can never recede far from the

the center; so that the common center of gravity of the earth, sun, and planets, may be esteemed the center of the whole world. See the article PLANET.

7. The planets move in ellipses that have their foci in the center of the sun, and describe areas proportionable to their times. This we have already laid down à posteriori, as a phænomenon; and now that the principle of the heavenly motions is shewn, we deduce it therefrom à priori. Thus, since the weights of the planets towards the sun are reciprocally as the squares of their distances from the center of the sun; if the sun were at rest, and the other planets did not act on each other, their orbits would be elliptical, having the sun in the common umbilicus, and would describe areas proportionable to the times; but the mutual actions of the planets are very small, and may be well thrown aside. See the article ORBIT.

Indeed the action of jupiter on saturn is of some consequence; and hence, according to the different situation and distances of those two planets, their orbits will be a little disturbed. The earth's orbit too is sensibly disturbed by the action of the moon; and the common center of the two describes an ellipsis round the sun placed in the umbilicus; and, with a radius drawn to the center of the sun, describes areas proportionable to the times. See the article EARTH, &c.

8. The aphelia and nodes of the planets are at rest, excepting for some inconsiderable irregularities arising from the action of the revolving planets, and comets. Consequently, as the fixed stars retain their position to the aphelia and nodes, they too are at rest. See the article NODES, &c.

9. The axis, or polar diameter, of the planets is less than the equatorial diameter.

The planets, had they no diurnal rotation, would be spheres, as having an equal gravity on every side: but by this rotation the parts receding from the axis endeavour to rise towards the equator, which, if the matter they consist of be fluid, will be affected very sensibly. Accordingly, jupiter, whose density is found not much to exceed that of water on our globe, is observed by astronomers to be considerably less between the two poles than from east to west. And, on the same principle, unless our earth were higher at the equator than towards the poles, the sea would rise under the equator, and overflow all near it. But this figure of the earth Sir Isaac Newton proves likewise à posteriori, from the oscillations of pendulums being slower and smaller in the equinoctial, than in the polar parts of the globe. See the article EARTH.

10. All the moon's motions, and all the inequalities of these motions, follow from these principles, *e. gr.* her unequal velocity, and that of her nodes and apogee in the syzygies and quadratures; the differences in her eccentricity and her variation. See the article MOON.

11. From the inequalities of the lunar motions, we can deduce the several inequalities in the motions of the satellites.

12. From these principles, particularly the action of the sun and moon upon the earth, it follows, that we must have tides, or that the sea must swell and subside twice every day. See TIDES.

13. Hence, likewise, follows the whole theory of comets, as that they are above the region of the moon, and in the planetary spaces; that they shine by the sun's light, reflected from them; that they move in conic sections, whose umbilici are in the center of the sun; and, by radii drawn to the sun, describe area's proportional to the times; that the orbits or trajectories are very nearly parabola's; that their bodies are solid, compact, &c. like those of the planets, and must therefore acquire an immense heat in their perihelia; that their tails are exhalations arising from and encompassing them like atmospheres. See the article COMET.

NEYLAND, a market-town of Suffolk, fourteen miles south-west of Ipswich.

NIAGARA, a prodigious cataract in Canada, in North America, between the lakes Erie and Ontario, where the water falls from high rocks 156 feet perpendicular. The mist which this fall occasions may be seen at fifteen miles distance rising as high as the clouds, and forming a beautiful rainbow.

NIBANO, a town of Italy, in the dutchy of Parma, thirty-five miles west of Parma.

NICARAGUA, a province of Mexico, bounded by the province of Honduras, on the north; by the North-sea on the east; by the province of Costarica, on the south east; and by the South-sea, on the south-west; being 400 miles long, and 120 broad. Nicaragua lake runs through the middle of the province.

NICARIA, one of the islands of the Archipelago;

chipelago, in Afiatic Turky: eaft lon. 26° 5′ north lat. 37°.

NICASTRO, a town of Naples, in the territory of Calabria: eaft long. 16° 40′, north lat. 39° 15′.

NICE, the capital of the county of the fame name, fituated on the Mediterranean, at the mouth of the river Var: eaft long. 7° 15′, north lat. 43° 40′.

NICE is alfo a town of Afiatic Turky, fifty miles fouth-eaft of Conftantinople.

NICHE, in architecture, a hollow funk into a wall, for the commodious and agreeable placing a ftatue.

The ordinary proportion of a niche is to have two circles in height and one in width; but M. Le Clerc makes their height fomething more, the excefs being to compenfate for the height of the pedeftal of the ftatue. The hollow is femicircular at bottom, that is, in its plan; and at top it terminates in a kind of canopy. Niches have frequently an impoft, and an archivolt or head-band, and the canopy wrought and enriched in the manner of a fhell. The breadth of the archivolt may be made equal to a fixth or feventh part of the niche, and the height of the impoft to a fifth or fixth part of the fame: and the impoft and archivolt ought to confift of fuch mouldings as have fome relation to the architecture of the place. Niches are fometimes made with ruftic-work, fometimes with fhell-work, and fometimes of cradle or arbour-work. Niches are fometimes made fquare, but thefe want all the beauty of the others.

NICHED COLUMN. See COLUMN.

NICHILS, or NIHILS, in law. See the article NIHILS.

NICOBAR-ISLANDS, a clufter of iflands fituated in the Indian ocean, at the entrance of the gulph of Bengal, between 7° and 10° north lat.

NICOLAITANS, in church-hiftory, chriftian heretics who affumed this name from Nicolas of Antioch; who, being a gentile by birth, firft embraced judaifm, and then chriftianity; when his zeal and devotion recommended him to the church of Jerufalem, by whom he was chofen one of the firft deacons. Many of the primitive writers believe that Nicolas was rather the occafion than the author of the infamous practices of thofe who affumed his name, who were exprefsly condemned by the fpirit of God himfelf, Apoc. ii. 6. And indeed their opinions and actions were highly extravagant and criminal. They allowed a community of wives: made no difference between ordinary meats and thofe offered to idols: and told I know not what fables of the creation and difpofition of the world. According to Eufebius, they fubfifted but a fhort time; but Tertullian fays, that they only changed their name, and that their herefies paffed into the fect of the cainians. See CAINIANS.

St. NICOLAS, a town of Lorrain, ten miles fouth-eaft of Nancy, at the mouth of the river Dwina.

St. NICOLAS is alfo a port-town of Ruffia fituated on the White-fea, fix miles below Archangel.

St. NICOLAS'S DAY, a feftival of the romifh church, obferved on the 6th of December.

NICOMEDIA, a city of Afiatic Turky, thirty miles fouth-eaft of Conftantinople.

NICOPOLIS, a city of European Turky, fituated on the Danube, 100 miles northweft of Adrianople: eaft long. 25°, north lat. 43°.

NICOPPING, a city of Sweden, in the province of Sunderland, fifty miles fouth of Stockholm.

NICOPPING is alfo the capital of the ifland Hulfter, fubject to Denmark, and forty-eight miles fouth-weft of Copenhagen.

NICOSIA, the capital of the ifland of Cyprus: eaft long. 35°, north lat. 35°.

NICOTERA, a port-town of the kingdom of Naples, thirty miles north-eaft of Reggio.

NICOTIANA, in botany, a plant more commonly known by the name of tobacco. See the article TOBACCO.

NICOYA, or *St.* LUCAR, a port-town of Mexico, fituated on a bay of the South-fea, in 88° weft longitude, and 10° 15′ north latitude.

NICTITATING MEMBRANE, in comparative anatomy, a thin membrane, chiefly found in the bird and fifh-kind, which covers the eyes of thefe animals, fheltering them from the duft or too much light; yet is fo thin and pellucid, that they can fee pretty well through it.

NIDUS, among naturalifts, fignifies a neft, or proper repofitory for the eggs of birds, infects, *&c.* wherein the young of thefe animals are hatched and nurfed.

NIECE, a brother or fifter's daughter, which in the civil law is reckoned the third degree of confanguinity.

NIEMEN, or BEREZINA, a river of Poland, which rifes in Lithuania, and falls into a bay of the Baltic-fea, near Memel.

NIEN

NIENHUIS, a town of Germany, in the circle of Weſtphalia: eaſt long. 8° 25′, north lat. 51° 40′.

NIENT COMPRISE, in law, an exception taken to a petition as unjuſt, becauſe the thing deſired is not in the deed on which the petition is founded. Thus on a perſon's deſiring the court to be put in poſſeſſion of a houſe, formerly adjudged to him among other lands, the adverſe party pleads that the petition ought not to be granted; becauſe though the petitioner had a judgment for certain lands and houſes, yet that houſe is nient compriſe, not compriſed therein.

NIEPER, or BORISTHENES, a river which riſes in the middle of Ruſſia, and running ſouth through Poland, enters the ruſſian Ukrain, ſeparates Little Tartary from Budziac Tartary, and falls into the Black-ſea, near Oczakow.

NIESTAT, a town of Lower Saxony, in the dutchy of Mecklenburg: eaſt long. 11° 26′, north lat. 53° 40′.

NIESTAT is alſo a town of Upper Saxony, in the marquiſate of Brandenburg, 25 miles north-eaſt of Berlin.

NIESTER, a river which riſes in Poland, and running ſouth-eaſt divides Podolia in Poland, from Moldavia in Turky, and afterwards dividing Beſſarabia from Budziac Tartary, falls into the Black-ſea near Belgorod.

NIGELLA, in botany, a genus of the polyandria pentagynia claſs of plants; the corolla whereof conſiſts of five plane, oval, obtuſe, patent petals, narroweſt towards the baſe; the fruit conſiſts of as many capſules, as there were germina, which in ſome ſpecies are five, and in others ten, theſe capſules are oblong, compreſſed, acuminated, joined by an internal ſuture, and open upwards, and inwards; the ſeeds are numerous angular and rough.

NIGER, a great river of Africa, which runs from eaſt to weſt through the middle of Negroland, and diſcharges itſelf into the Atlantic ocean by three channels, called Rio Grande, Gambia, and the river Senega. It is 300 miles between the northern and ſouthern channels, and all the country between them is annually overflowed, as Egypt is by the Nile.

NIGHT, that part of the natural day during which the ſun is underneath the horizon; or that ſpace wherein it is duſky. See the article DAY.

Night was originally divided by the Hebrews, and other eaſtern nations, into three parts, or watchings. The Romans, and afterwards the Jews from them, divided the night into four parts, or watches, the firſt of which began at ſun-ſet and laſted till nine at night, according to our way of reckoning; the ſecond laſted till midnight; the third till three in the morning; and the fourth ended at ſun-riſe. The antient Gauls and Germans divided their time not by days but by nights; and the people of Iceland and the Arabs do the ſame at this day. The like is alſo obſerved of our ſaxon anceſtors.

NIGHT-MARE, in medicine, a diſeaſe called by phyſicians ephialtes and incubus. See the article INCUBUS.

NIGHT-WALKERS, *Noctambuli.* See the article NOCTAMBULI.

NIGHTINGALE, *luſcinia*, in ornithology, the browniſh-grey motacilla, with the annules of the knees grey. See the article MOTACILLA.

This bird is more eminent for the ſweetneſs of its note, than for its beauty; it is of the ſize of the linnet, but in ſhape it more reſembles the red-breaſt; the head is ſmall, the eyes are large, and their iris pale; the beak is duſky, ſlender, and moderately long; the head, neck and back are of a greyiſh-brown; the upper parts of the wings, and about the tail, have a tinge of reddiſh mixt with this; and the throat, breaſt and belly are of a pale whitiſh grey.

NIGRITIA, or NEGROLAND. See the article NEGROLAND.

NIHIL CAPIAT PER BREVE, or PER BILLAM, in law, the judgment given againſt the plaintiff in an action either in bar thereof, or in abatement of the writ.

NIHIL DICIT, a failure in the defendant to put in an anſwer to the plaintiff's declaration, *&c.* by the day aſſigned for that purpoſe, by which omiſſion judgment of courſe is had againſt him.

NIHIL DEBET, is the uſual plea in an action of debt: but it is no plea in an action of covenant, in a breach aſſigned for non-payment of rent, *&c.*

NIHIL HABUIT IN TENEMENTIS, a plea that can be pleaded only in an action of debt brought by a leſſor againſt a leſſee without deed: for if it be by indenture of leaſe it may not be pleaded, the leaſe being an eſtoppel: yet it is ſaid, that if it be upon a deed poll, the defendant may plead this plea.

NIHILS, or NICHILS, iſſues which a ſheriff who

who is appofed in the exchequer fays are nothing worth, and not to be levied, thro' the infufficiency of the parties from whom the fame are due.

NILE, a great river in Egypt, having its fource in Abyffinia, or the Upper Ethiopia, in 12° north lat. It generally runs from fouth to north through Abyffinia into Egypt, and then continues its courfe north in one ftream till it comes below Cairo to the Delta, where it divides; one branch difcharging itfelf into the Mediterranean at Damieta, and another a hundred miles to the weftward of it at Rofetta. There are great rejoicings every year when the Nile rifes to a certain height, their future harveft depending upon it. The inftrument ufed by the antients to meafure the height of the water of the Nile in its overflowings, was called nilometer. The juft height of the inundation, according to Pliny, is fixteen cubits; when it arifes but to twelve or thirteen, a famine is dreaded; and when it exceeds fixteen, there is alfo danger apprehended. The river begins ufually to rife in May or June, and is conveyed by refervoirs, cifterns, and canals, to the fields and gardens as they want it.

As to the Delta, it is all overflowed.

NIMBUS, in antiquity, a circle obferved on certain medals, or round the head of fome emperors, anfwering to the circles of light, drawn around the images of faints. The nimbus is feen on the medals of Maurice, Phocas, and others, even of the upper empire.

NIMEGUEN, a city of the united Netherlands, fituated on the river Waal, in the province of Guelderland, 52 miles fouth-eaft of Amfterdam.

NIMETULAHITES, a kind of turkifh monks, fo called from their founder Nimetulahi, famous for his doctrines and the aufterity of his life. They affemble once a week to fing hymns in praife of God. The candidates for this order are obliged to continue forty days fhut up in a chamber, where their daily allowance is but four ounces of food; and no body is permitted to vifit them. At the end of this faft the other religious take the novice by the hand and perform a kind of dance, in which they ufe feveral extravagant geftures; during which exercife the novice commonly falls down in a trance, at which time they fay he receives fome extraordinary revelation.

NIMPO, a city and port-town of China, in the province of Chekiam: eaft long. 122°, north lat. 30°.

NINEVEH, an antient city of Affyria, was fituated on the eaftern banks of the river Tygris, oppofite to the place where Mouffal now ftands.

NINOVE, a town of the auftrian Netherlands, in the province of Flanders, fituated on the river Dender, thirteen miles weft of Bruffels.

NIO, a fmall turkifh ifland in the Archipelago, fituated north-weft of Santorini, remarkable for little but the tomb of Homer, who is faid to lie buried here.

NIORT, a town of France, in the province of Orleanois and territory of Poictou, fituated on the river Seure, twenty-eight miles north-eaft of Rochelle.

NIPHON, the largeft of the japan iflands, fituated in the Indian ocean about 130 miles eaft of China; being 600 miles long, and 150 broad, and containing 55 provinces.

NIPPERS, in the manege, are four teeth in the fore-part of a horfe's mouth, two in the upper and two in the lower jaw. A horfe puts them forth between the fecond and third year. See TOOTH.

NIPPERS is alfo an inftrument in ufe among fmiths and farriers; being a kind of pincers wherewith, in fhoeing a horfe, they cut the nails before they rivet them. It is alfo ufed in taking off a fhoe.

NIPPERS, in a fhip, are fmall ropes about a fathom or two long, with a little truck at one end, and fometimes only a wale-knot. Their ufe is to help holding off the cable from the main or jeer-capftan, where the cable is fo flimy, fo wet, and fo great, that they cannot ftrain it, to hold it off with their bare hands.

NIPPLES, *papillæ*, in anatomy. See the article BREASTS.

The nipples of women, in their firft lying in, are frequently fo fmall, and funk into their breafts, that the infant cannot get at them to fuck its nourifhment. Heifter obferves that the readieft method in this cafe is to apply an infant fomewhat older, and which can draw ftronger; or, if this does not fucceed, to let a woman who has been practifed in the art, attempt to fuck. When thefe do not fucceed, it is common to have recourfe to a glafs pipe, and the poorer people in fome places ufually make a tobacco pipe ferve the turn. Others apply a fmall cucurbite made of ivory in the form of a hat, which they fuck ftrongly

in

in their mouth. The common ſucking-glaſs is alſo, when properly applied, of very ſignal ſervice. To do this, the ſmall hole at the ſide is to be ſtopped with wax, and the glaſs heated with warm water; or, by holding it before the fire, ſo as to rarify, and in part, expel the air. It is then to be applied to the nipple, which, in this caſe, will not only be pulled out, but will diſcharge a large quantity of milk, ſo as to take down the inflammation and tumor in the breaſt. When the ſucking power of the glaſs is grown weak, the hole at the ſide is to be opened, and the milk poured out; the glaſs is then to be heated again, and, the hole being ſtopped again, is to be a ſecond time applied, and ſo on, till the intention is fully anſwered.

NIPPLE-WORT, *lapſana*, in botany. See the article LAPSANA.

NISI PRIUS, in law, a judicial writ which lies in caſes where the jury being impannelled and returned before the juſtices of the bank, one of the parties requeſts to have ſuch a writ, for the eaſe of the country, in order that the trial may come before the juſtices in the ſame county on their coming thither. Theſe trials by niſi prius are intended for the eaſe of the country, by ſaving the parties, jurors and witneſſes the trouble of coming to Weſtminſter. The purport of a writ of niſi prius is, that the ſheriff is thereby commanded to bring to Weſtminſter the men impanelled, at a certain day before the juſtices, "niſi prius juſti-"ciarii domini regis ad aſſiſas capiendas "venerint;" that is, unleſs the juſtices go before the day into ſuch a county to take aſſizes. See JUSTICES.

NISMES, a fine city of France, in the province of Languedoc: eaſt long. 4° 26′, north lat. 43° 40′.

NISNA, or NISE-NOVOGOROD, the capital of the province of Niſe, or Little Novogorod, in Ruſſia: eaſt long. 45°, north lat. 56°.

NISSA, a city of european Turky, in the province of Servia: eaſt long. 23°, north lat. 43°.

NISSA, or NIZZA, a town of Italy, in the dutchy of Montferrat: eaſt long. 8° 40′, north lat. 44° 45′.

NITHSDALE, a county of Scotland, bounded by Clydeſdale, on the north; by Annandale, on the eaſt; by Solway-frith, on the ſouth; and by Galloway, on the weſt.

NITRACHT, or NYTREA, a town of Hungary, forty miles north-eaſt of Preſburg.

NITRE, or SALT-PETRE, is a ſimple ſalt, which is pellucid, but ſomewhat whitiſh, and in its moſt perfect pieces is in the form of long and ſlender cryſtals, of a priſmatic figure, of an equal thickneſs throughout their whole length, compoſed of ſix planes or ſides, and terminated at the end by a pyramid, which is ſmall and ſhort in proportion to the ſize of the column, but compoſed of the ſame number of planes. Theſe ſprigs vaſtly reſemble the common ſprig cryſtals of the rocks. Nitre is to be choſen in fair, long, and tranſparent cryſtals, and ſuch as when applied to the tongue, affects it with a peculiar kind of coldneſs; ſuch as when ſet on the fire eaſily melts, and on being thrown upon it, blazes very furiouſly, and emits a bright and vivid flame without crackling, and leaves only a very little fixed ſalt on the coals.

Nitre is found immerſed in imperceptible particles in earthy ſubſtances, as the particles of metals in their ores; but ſometimes it is found native and pure, in the form of an efflorеſcence or ſhapeleſs ſalt, either on its ore or on old walls. The earth from which nitre is made, both in Perſia and the Eaſt-Indies, is a kind of marl, found on the bare cliffs on the ſides of hills expoſed to the northern or eaſtern winds, and never in any other ſituation. The people of thoſe countries collect large quantities of this, and having a large and deep pit, which they line with a hard and tenacious kind of clay, they fill it half full of water, and into this they throw the earth; when this is broken and mouldered to powder they add more water, and ſtirring all well together, they let it ſtand four or five days; after this they open a hole made in one of the ſides of the pit, which lets out all the clear water into a channel of about a foot wide, which is in the ſame manner clayed within, through which it runs into another very wide and ſhallow pit, which is prepared in a level ground, and is ſecured by ſlight walls on all but the north-eaſt ſide, and is open to the ſun at the top; here the water by degrees evaporates, and the ſalt which it had embibed from the earth, cryſtallizes into ſmall, browniſh-white hexaedral, but uſually imperfect cryſtals, which are preſerved; and this is the rough ſaltpetre we receive from the Eaſt Indies. The far greater part of the nitre uſed in the world

world is prepared in this manner; tho' there are many other methods of procuring it. In ſeveral of the eaſtern nations, the ruins of old buildings expoſed to the north and eaſt winds, and ſheltered from rain, have their walls covered with an eſfloreſcence of a nitrous ſalt, which they throw into the ſolution of the ſalt from the ore, when it will no longer afford any cryſtals of itſelf, and by this addition it becomes capable of affording a large quantity of additional cryſtals like the firſt. Earths moiſtened or manured with the excrements of animals, as the earths of pigeon-houſes, and the like, all afford more or leſs nitre; and vaſt quantities of this ſalt are annually made in France, by boiling in water the matter of old walls, the old plaſter of ruined buildings, and the earths of ſtables and other places where animals have been fed.

Saltpetre is a very profitable branch of commerce in England, and there is no doubt but that great quantities of it might be made; that from the Eaſt-Indies pays, on importation, for every 112 lb. 5 s. $8\frac{40}{100}$d. and draws back on exportation, 5 s. $2\frac{70}{100}$d. That from France, for every 112 lb. pays, on importation, 11 s. $7\frac{65}{100}$d. and draws back, on exportation, 6s. $1\frac{95}{100}$d. and the ſame quantity from all other places pays, on importation, 1 s. $11\frac{40}{100}$d. and draws back, on exportation, 1 s. $5\frac{75}{100}$d.

Saltpetre is of very great uſe in the manufactures; beſides being the baſis of gunpowder, it is uſed in the making of white glaſs, and is of the ſame uſe as common ſalt in preſerving of foods.

Preparations and uſes of NITRE. Purified nitre is one of the capital remedies in medicine. It cools and thins the blood, and gives it a fine florid colour; and therefore in all inflammatory diſeaſes attended with condenſations of the blood, this ſalt proves excellently cooling and attenuating. It is greatly ſerviceable in pleuriſies, peripneumonies and quinſies, in the ſuppreſſion of urine, and in the ſmall pox.

For the manner of purifying nitre, ſee the article GUNPOWDER.

The other preparations of nitre are Glauber's ſpirit of nitre, the ſweet ſpirit of nitre, vitriolated nitre, and aquafortis. 1. Spirit of nitre is prepared as follows: dry eighteen ounces of nitre, and reduce it to an impalpable powder: put it into a clean retort, and pour upon it ſix ounces of highly rectified oil of vitriol; place the retort immediately in a ſand furnace, and apply a large receiver, luting the juncture with Windſor-loam. Let the fire be gentle at firſt, increaſing it gradually till it riſes to the utmoſt heat a ſand furnace is capable of, then, when no more comes over, let all cool; and pour the liquor out of the receiver into a bottle under a chimney, taking care to avoid the dangerous fumes, and ſtop it cloſe up for uſe. This ſpirit diſſolves ſilver, and moſt of the other metals and ſemi-metals, and even ſtones of all kinds, except ſuch as have cryſtal for their baſis. 2. Sweet ſpirit of nitre is thus prepared: take of rectified ſpirit of wine, one quart; of Glauber's ſpirit of nitre, half a pound; mix them by pouring the ſpirit of nitre on the other, and diſtil the mixture with a gentle heat, as long as what comes off will not raiſe any fermentation with a lixivial ſalt. This is a noble diuretic and carminative. It is given in the ſtone and gravel with great ſucceſs, as alſo in jaundices and dropſies; and it is of great ſervice in reſtoring the appetite when depraved by a mucous flegm. The doſe is from fifteen to thirty drops in wine and water. 3. Vitriolated nitre is thus prepared: diſſolve the cake left after the diſtillation of Glauber's ſpirit of nitre, in hot water, and after filtrating the ſolution through paper, evaporate, that the ſalt may ſhoot. This has much the ſame virtues as tartarum vitriolatum, and is frequently ſold under its name. 4. Aquafortis, for the preparation and uſes of which, ſee the article AQUAFORTIS.

NITRE *of the antients*. See NATRUM.

NIUCHE, a kingdom of chineſian Tartary, north of the province of Laotung.

NIVELLE, a town of the auſtrian Netherlands, and province of Brabant, fourteen miles ſouth of Bruſſels.

NIVERNOIS. See the article NEVERS.

NIXABOUR, or NISABOUR, a city of Perſia, in the province of Choraſſan: eaſt long. 57° 32′, north lat. 35° 40′.

NOAH's ARK, in ſcripture antiquity. See the article ARK.

NOAH's ARK-SHELL, in natural hiſtory, a name given to ſeveral ſpecies of cardia, or heart-ſhells; being of an irregular oblong figure, and variouſly furrowed and ſtriated. See the article CARDIA.

NOBILIARY, in literary hiſtory, a book containing the hiſtory of the noble families of a nation, or province: ſuch are Chorier's Nobiliary of Dauphine, and

and Caumartin's Nobiliary of Provence. The Germans are ſaid to be particularly careful of their nobiliaries, in order to keep up the purity of their families.

NOBILISSIMUS, MOST NOBLE, in roman antiquity, a title given to the princes of the imperial family, and which was beſtowed on the Cæſars as early as the reign of Trajan; thus nobilis Cæſar, or N. C. that is nobiliſſimus Cæſar, is found on ſome of the antient medals. Triſtan ſays, that the Cæſars bore the title of nobiliſſimi in all ages, but that the nobiliſſimate became a diſtinct independant dignity in the time of Conſtantine the Great.

NOBILITY, a quality that ennobles, and raiſes a perſon poſſeſſed of it above the rank of a commoner.

The origin of nobility in Europe is by ſome referred to the Goths; who, after they had ſeized a part of Europe, rewarded their captains with titles of honour, to diſtinguiſh them from the common people. In Britain the term nobility is reſtrained to degrees of dignity above knighthood: but every where elſe nobility and gentility are the ſame. The britiſh nobility conſiſts only of five degrees, *viz.* that of a duke, marquis, earl or count, viſcount, and baron, each of which ſee under their proper articles. In Britain theſe titles are only conferred by the king, and that by patent, in virtue of which it becomes hereditary. The privileges of the nobility are very conſiderable, they are all eſteemed the king's hereditary counſellors, and are privileged from all arreſts, unleſs for treaſon, felony, breach of peace, condemnation in parliament, and contempt of the king. They enjoy their ſeats in the houſe of peers by deſcent, and no act of parliament can paſs without their concurrence: they are the ſupreme court of judicature, and even in criminal caſes give their verdict upon their honour, without being put to their oath. In their abſence they are allowed a proxy to vote for them, and in all places of truſt are permitted to conſtitute deputies, by reaſon of the neceſſity the law ſuppoſes them under of attending the king's perſon: but no peer is to go out of the kingdom without the king's leave, and when that is granted, he is to return with the king's writ, or forfeit goods and chattels. See PARLIAMENT, PEER *of the realm*, &c.

NOBLE, a money of account containing ſix ſhillings and eight-pence.

The noble was antiently a real coin ſtruck in the reign of Edward III. and then called the penny of gold; but it was afterwards called a roſe-noble, from its being ſtamped with a roſe: it was current at 6 s. 8 d.

NOCERA, a town of Italy, in the territory of the pope and dutchy of Spoletto, twenty miles north-eaſt of Spoletto.

NOCERA DE PAGANI, a town of the kingdom of Naples, fifteen miles ſouth of the city of Naples.

Terra NOCERIANA, EARTH OF NOCERA, in the materia medica, a ſpecies of bole, remarkably heavy, of a greyiſh-white colour, of an inſipid taſte, and generally with ſome particles in it which grit between the teeth. See BOLE.

It is much eſteemed, by the Italians, as a remedy for venemous bites, and in fevers; but except its aſtringent quality, little dependence is to be had on the other virtues aſcribed to it.

NOCTAMBULI, or NOCTAMBULONES, or SOMNAMBULI, NIGHTWALKERS, in medicine, a term applied to perſons who have a habit of riſing and walking about in their ſleep. See INCUBUS.

This, according to Junker, is a very remarkable diſtemperature of the imagination, and in different perſons differs greatly in degree. Thoſe who are but moderately affected with it, only repeat their actions of the day, and getting out of their bed go quietly to the places they frequent at other times: but thoſe who are afflicted with it in the moſt violent degree, go up to dangerous places, and do things that would terrify them to think of when awake. Theſe are by ſome called lunatic nightwalkers, becauſe fits are obſerved to return with more frequency and greater violence at the changes of the moon. The only material cauſe that can be aſſigned in this caſe is a plethora, or over-fulneſs of blood; but this is influenced by an immaterial one, that is by the fancy, which is buſily employed in dreams about particular objects.

As to the method of cure, the ſame author obſerves, that the primæ viæ are firſt to be cleared of all their foulneſſes by a ſtrong purge; after this it is proper to bleed in the foot, taking away eight or ten ounces; then powders compoſed of cinnabar, nitre, and crab's eyes, ſhould be taken three or four times a day; and particular regard ſhould be had to the changes of the moon. It will be proper to ſet a veſſel of water by the bedſide, in ſuch a manner that the perſon will naturally

rally ſtep into it on getting out, and be awaked by that means; and if theſe things fail, a perſon ſhould ſit up to watch him, and beat him every time it happens.

NOCTANTUR, in law, a writ that iſſues out of the court of chancery, and is returnable in the king's bench; and lies where a perſon having a right to improve waſte ground, erects a hedge or ditch, which is thrown down in the night-time, and it cannot be known by a jury by whom ſuch damage was done: in that caſe if the neighbouring villages do not find out and indict the offenders, they ſhall be diſtrained to make good the ſame at their own coſts, *&c.*

NOCTILUCA, in phyſiology, a ſpecies of phoſphorus, ſo called becauſe it ſhines in the night without any light being thrown upon it; ſuch is the phoſphorus made of urine. See PHOSPHORUS.

NOCTUA, a name applied to ſeveral different ſpecies of owls. See OWL.

NOCTURNAL, ſomething relating to the night, in contradiſtinction to diurnal. See the article DIURNAL.

NOCTURNAL ARCH, in aſtronomy, the arch of a circle deſcribed by the ſun, or a ſtar, in the night. See ARCH.

Semi-NOCTURNAL *arch of the ſun*, is that portion of a circle he paſſes over between the lower part of our meridian and the point of the horizon, wherein he ariſes; or between the point of the horizon wherein he ſets, and the lower part of our meridian.

NOCTURNAL, NOCTURLABIUM, an inſtrument chiefly uſed at ſea, to take the altitude or depreſſion of ſome ſtars about the pole, in order to find the latitude and hour of the night.

Some nocturnals are hemiſpheres, or planiſpheres, on the plane of the equinoctial. Theſe commonly in uſe among ſeamen are two; the one adapted to the polar ſtar, and the firſt of the guards of the little bear; the other to the pole-ſtar, and the pointers of the great bear.

This inſtrument conſiſts of two circular plates (plate CLXXXVI. fig. 4.) applied to each other. The greater, which has a handle to hold the inſtrument, is about 2½ inches diameter, and is divided into twelve parts, agreeing to the twelve months, and each month ſub-divided into every fifth day; and ſo as that the middle of the handle correſponds to that day of the year wherein the ſtar here regarded has the ſame right aſcenſion with the ſun. If the inſtrument be fitted for two ſtars, the handle is made moveable. The upper left circle is divided into twenty-four equal parts for the twenty-four hours of the day, and each hour ſub-divided into quarters. Theſe twenty-four hours are noted by twenty-four teeth to be told in the night. Thoſe at the hours 12, are diſtinguiſhed by their length. In the center of the two circular plates is adjuſted a long index, A, moveable upon the upper plate. And the three pieces, *viz.* the two circles and index, are joined by a rivet which is pierced through the center with a hole, through which the ſtar is to be obſerved.

To uſe the NOCTURNAL, turn the upper plate till the long tooth, marked 12, be againſt the day of the month on the under plate: then, bringing the inſtrument near the eye, ſuſpend it by the handle with the plane nearly parallel to the equinoctial; and viewing the pole-ſtar through the hole of the center, turn the index about till, by the edge coming from the center, you ſee the bright ſtar or guard of the little bear (if the inſtrument be fitted to that ſtar): then that tooth of the upper circle, under the edge of the index, is at the hour of the night on the edge of the hour circle: which may be known without a light, by counting the teeth from the longeſt, which is for the hour 12.

NODATED HYPERBOLA, a name given by Sir Iſaac Newton, to a kind of hyperbola, which, by turning round, decuſſates or croſſes itſelf. See HYPERBOLA.

NODE, *nodus*, in ſurgery, a tumour ariſing on the bones, and uſually proceeding from ſome venereal cauſe; being much the ſame with what is otherwiſe called exoſtoſis. See the article EXOSTOSIS.

This word is more particularly applied to the tumours or protuberances ariſing on the joints of old gouty people, called alſo tophi. See the article TOPHUS.

Some give the denomination of nodes, to all tumours formed by a coagulation of viſcous matter in the external parts of the body. See TUMOUR, *&c.*

NODES, in aſtronomy, the two points wherein the orbit of a planet interſects the ecliptic; ſuch are the points C and D, pl. CLXXXVIII. fig. 1, n° 1. whereof the node C, where the planet aſcends northwards, above the plane of the ecliptic, is called the aſcending node, the northward node, and the head of the dragon, and is marked thus ☊; the other node D, where the planet deſcends to the ſouth, is

 called

called the defcending node, the fouthward node, or the dragon's tail, marked thus ☋. See the article DRAGON.

The line CD, wherein the two circles CEDF and CGDH interfect, is called the line of nodes. It appears from obfervation, that the line of the nodes of all the planets conftantly changes its place, and fhifts its fituation from eaft to weft, contrary to the order of the figns; and that the line of the moon's nodes, by a retrograde motion, finifhes its circulation in the compafs of 19 years; after which time, either of the nodes having receded from any point of the ecliptic, returns to the fame again: and when the moon is in the node, fhe is alfo feen in the ecliptic. If the line of nodes were immoveable, that is, if it had no other motion than that whereby it is carried round the fun, it would always look to the fame point of the ecliptic, or would keep parallel to itfelf, as the axis of the earth does. See EARTH and MOON.

From what has been faid, it is evident, that the moon can never be obferved precifely in the ecliptic, but twice in every period; that is, when fhe enters the nodes. When fhe is at her greateft diftance from the nodes; *viz.* in the points E, F, fhe is faid to be in her limits. See LIMIT.

The moon muft be in or near one of the nodes, when there is an eclipfe of the fun or moon. See ECLIPSE.

To make the foregoing account of the motion of the moon's nodes ftill clearer, let the plane of n° 2. *ibid.* reprefent that of the ecliptic, S the fun, T the center of the earth, L the moon in her orbit DN*dn*. N*n* is the line of the nodes paffing between the quadrature Q, and the moon's place L, in her laft quarter. Let now LP, or any part LS, reprefent the excefs of the fun's action at L, above his action at T; and this being refolved into the force LR, perpendicular to the plane of the moon's orbit; and PR parallel to it, it is the former only that has any effect to alter the pofition of the orbit, and in this it is wholly exerted. Its effect is twofold: 1. It diminifhes its inclination by a motion which we may conceive as performed round the diameter D*d*, to which LT is perpendicular. 2. Being compounded with the moon's tangential motion at L, it gives it an intermediate direction L*t*, through which, and the center, a plane being drawn, muft meet the ecliptic nearer the conjunction C, than before.

NODULE, or NODULUS, a word ufed in pharmacy, for a knot tied in a rag, and including fome medicinal ingredients to be fufpended in any liquor, as beer, or wine, to give it a tincture, or the like.

It fignifies alfo a parcel of odoriferous fimples, tied up in a piece of filk, for the patient to be frequently fmelling to.

NODUS, or NODE, in dialling, a certain point or pole in the gnomon of a dial, by the fhadow or light whereof, either the hour of the day in dials without furniture, or the parallels of the fun's declination, and his place in the ecliptic, &c. in dials with furniture, are fhewn. See DIAL.

NODUS is alfo ufed for a hole in the ceiling of a room, or in the window, for making of a dial on the floor, wall, or the like.

NOERA, a word ufed by chemifts, for the head of an alembic, or the cover of a cucurbite, or any other veffel ufed in diftillation.

NOETIANS, in church-hiftory, chriftian heretics in the IIId century, followers of Noetius, a philofopher of Ephefus, who pretended that he was another Mofes, fent by God; and that his brother was a new Aaron. His herefy confifted in affirming that there was but one perfon in the Godhead; and that the Word and the Holy Spirit were but external denominations, given to God, in confequence of different operations; that as creator, he is called Father; as incarnate, Son; and as defcending on the apoftles, Holy Ghoft.

NOGAIAN-TARTARS, a nation which inhabits that part of Circaffia, in afiatic Turky, that lies between the Palus Meotis and the Cafpian fea.

NOGENT, a town of France, in the province of Champaign, fituated on the river Seine, twenty-five miles north-weft of Troyes.

NOLA, a town of Italy, in the kingdom of Naples, fituated 16 miles eaft of Naples.

NOLI, a town of Italy in the territory of Genoa, fituated on the bay of Genoa, thirty-five miles fouth-weft of that city.

NOLI ME TANGERE, TOUCH ME NOT, in medicine, a malignant eruption in the face, occafioned by an extremely fharp corrofive humour; thus called, either becaufe it affects thofe who touch it, or becaufe the more it is touched, the worfe it grows, and the farther it fpreads.

NOLI ME TANGERE, among botanifts, the SENSITIVE PLANT, the fame with mimofa. See the article MIMOSA.

NOLLE PROSEQUI, in law. See the article NON PROS.

NOMADES, in antiquity, a name given to ſeveral nations or people, whoſe whole occupation was to feed their flocks, and who had no fixed place of abode, but were conſtantly ſhifting, according to the conveniencies of paſturage.

NOMANCY, a name given to the art of divining the fates of perſons, by means of the letters that form their names; being nothing elſe but the cabbaliſtic gematria. See the article CABBALA.

NOMARCHA, in egyptian antiquity, the governor or commander of a nome. Egypt was antiently divided into ſeveral regions or quarters, called nomes.

NOMBRE DE DIOS, a town of Mexico, in the province of Darien, a little to the eaſtward of Porto Bello: weſt long. 83°, and north lat. 10°.

NOMBRIL POINT, in heraldry, is the next below the feſs-point, or the very center of the eſcutcheon. See POINT.

Suppoſing the eſcutcheon divided into two equal parts below the feſs, the firſt of theſe diviſions is the nombril, and the lower the baſe.

NOME, or NAME, in algebra, denotes any quantity with a ſign prefixed or added to it, whereby it is connected with ſome other quantity, upon which the whole becomes a binomial, trinomial, or the like: thus $a+b$ is a binomial, $a+b+c$ is a trinomial, whoſe reſpective names or nomes are a and b for the firſt, and a, b, and c, for the ſecond. See the article BINOMIAL, &c.

NOMENCLATOR, in roman antiquity, was uſually a ſlave, who attended upon perſons that ſtood candidates for offices, and prompted or ſuggeſted to them the names of all the citizens they met, that they might court them, and call them by their names; which, among that people, was the higheſt piece of civility.

NOMENCLATORES, among the botanical authors, are thoſe who have employed their labours about ſettling and adjuſting the right names, ſynonyms, and etymologies of names, in regard to the whole vegetable world.

NOMENCLATURE, *nomenclatura*, a catalogue of ſeveral of the more uſual words in any language, with their ſignifications, compiled in order to facilitate the uſe of ſuch words, to thoſe who are to learn the tongue: ſuch are our latin, greek, french, &c. nomenclatures.

NOMENEY, a town of Germany, in the dutchy of Lorrain, ſituated on the river Seille, fifteen miles north of Nancy.

NOMINALS, or NOMINALISTS, a ſect of ſchool-philoſophers, the diſciples and followers of Occam, or Ocham, an engliſh cordelier, in the XIVth century. They were great dealers in words, whence they were vulgarly denominated word-ſellers; but had the denomination of nominaliſts, becauſe that, in oppoſition to the realiſts, they maintained, that words, and not things, were the object of dialectics. See the article REALISTS.

The nominals, with the ſtoics, admit the formal conceptions or ideas of things, as the ſubject and foundation of univerſality; but to this they add names, which repreſent and ſignify, after the ſame univocal manner, and without any diſtinction, a great variety of ſingle things, alike both in genus and ſpecies. See STOICS.

NOMINATION, the act of naming and appointing a perſon for ſome function, employ, or benefice.

NOMINATION, in law, ſignifies the power that a perſon has of appointing a clerk to a patron of a benefice, by him to be preſented to the ordinary. This power or right of nomination a perſon may have by deed, whereby, if the patron refuſes to have the perſon nominated, or inſtead thereof preſents another, the nominator may bring a quare impedit. See QUARE, NOMINATOR, and PATRON.

NOMINATIVE, in grammar, the firſt caſe of nouns, which are declinable. See the articles CASE and NOUN.

The ſimple poſition or laying down of a noun, or name, is called the nominative caſe; yet it is not ſo properly a caſe, as the matter or ground whence the other caſes are to be formed, by the ſeveral changes and inflections given to this firſt termination. Its chief uſe is to be placed in diſcourſe before all verbs, as the ſubject of the propoſition or affirmation.

NOMINATOR, he who preſents a perſon to an office or benefice; whence the perſon named, or preſented, is called nominee. See the article NOMINATION.

It is held, in the caſe of a benefice, that the perſon who has the nomination, is in effect the patron of the church, and the other is but an inſtrument to him that nominates; nevertheleſs, when a nominator does not appoint a clerk within ſix months after the avoidance, but the patron preſents before the biſhop has taken the

the advantage of the lapfe, his clerk is to be admitted.

NOMOPHYLACES, Νομοφυλακες, among the Athenians, magiftrates who were to fee the laws executed, being not unlike to our fheriffs. They had the execution of criminals committed to their care, as alfo the charge of fuch as were confined prifoners. They had alfo power to feize thieves, kidnappers, and highwaymen, upon fufpicion; and, if they confeffed the fact, to put them to death; if not, they were obliged to profecute them in a judicial way.

NONAGESIMAL, in aftronomy, the 90th degree of the ecliptic, reckoned from the eaftern term, or point. See the article ECLIPTIC, &c.

The altitude of the nonagefimal is equal to the angle of the eaft, and, if continued, paffes through the poles of the ecliptic; whence the altitude of the nonagefimal, at a given time, under a given elevation of the pole, is eafily found. If the altitude of the nonagefimal be fubftracted from 90°, the remainder is the diftance of the nonagefimal from the vertex.

NON-ABILITY, in law, incapacity, or an exception taken againft a plaintiff, in a caufe, on fome juft ground, why he cannot commence a fuit in law; as his being attainted of felony, outlawry, &c.

NON-AGE, in law, generally fignifies all the time a perfon continues under the age of one and twenty; but in a fpecial fenfe it is all the time a perfon is under the age of fourteen. See AGE.

NON-APPEARANCE, a default in not appearing in a court of judicature. Attornies fubfcribing warrants for appearing in court, are liable to attachment and fine for non-appearance. If a defendant does not appear, and find bail upon a fcire facias and rule given, judgment may be had againft him.

NON-ASSUMPSIT, in law, is a general plea in a perfonal action, by which a man denies that he has made any promife.

NON-CAPE, in geography, a promontory on the weft coaft of Africa, oppofite the Canary-iflands.

NON-CLAIM, in law, fignifies the omiffion of him who challenges not his right within the time limited by law, as within five years after a fine is levied, &c. by which neglect he is barred of his right.

NON COMPOS MENTIS, in law, is ufed to denote a perfon's not being of found memory and underftanding. Of thefe perfons there are four different kinds, an ideot, a madman, a lunatic who has lucid intervals, and a drunkard who deprives himfelf of reafon by his own act and deed. In all thefe cafes, except the laft, one that is non compos mentis fhall not lofe his life for felony or murder; but the drunkard can have no indulgence on account of the lofs of his reafon, for, in the eye of the law, his drunkennefs does not extenuate but aggravate his offence. See IDIOT, LUNATIC, &c.

NON DAMNIFICATUS, in law, is a plea to an action of debt, on a bond, the condition of which is only to fave the plaintiff harmlefs.

NON DECIMANDO, a cuftom or prefcription, by which a perfon is difcharged from the payment of tythes.

NON DISTRINGENDO, in law, a writ granted in divers cafes, not to diftrain.

NON EST CULPABILIS, or NON CUL, in law, NOT GUILTY, the general plea to an indictment, or action of trefpafs, by which the defendant denies the crime or fact charged on him.

NON EST FACTUM, in law, is a plea where an action is brought upon a bond or other deed, and the defendant denies it to be his deed.

NON EST INVENTUS, is a fheriff's return to a writ, that the defendant is not to be found.

NON LIQUET, *it does not appear*; a verdict given by a jury, when a matter is to be deferred to another day of trial.

NON MOLESTANDO, a writ that lies for a perfon, molefted contrary to the king's protection granted him.

NON-NATURALS, in medicine, fo called becaufe by their abufe they become the caufes of difeafes. See DISEASE.

Phyficians have divided the non-naturals into fix claffes, *viz.* the air, meats and drinks, fleep and watching, motion and reft, the paffions of the mind, the retentions and excretions. See AIR, &c.

NON OBSTANTE, NOTWITHSTANDING, a claufe frequent in ftatutes and letters patent, importing a licence from the king to do a thing, which at common law might be lawfully done, but being reftrained by act of parliament, cannot be done without fuch licence.

NON OMITTAS, a writ that lies where the fheriff returns, upon a writ or procefs directed to him, that he has fent to the bailiff of the franchife, who has the return of writs, and that he neglects to ferve the writs fent him; upon which the fheriff is commanded to enter into fuch

franchise himself, and there to execute the king's process.

NON PLEVIN, a default in not replevying of land in due time.

NON PONENDO IN ASSISIS ET JURATIS, a writ which lies for freeing a person from serving on assizes and juries: where a person is exempted by charter, *&c.* he may sue the sheriff for returning him.

NON PROCEDENDO AD ASSISAM REGE INCONSULTO, is a writ granted for stopping the trial of a cause appertaining to a person who is in the king's service, till his majesty's pleasure be further known.

NON PROS, or NOLLE PROSEQUI, is where a plaintiff in an action does not declare in a reasonable time; in which case it is usual for the defendant's attorney to enter a rule for the plaintiff, to declare, after which a non pros may be entered. A nolle prosequi is esteemed a voluntary confession, that the plaintiff has no cause of action; and therefore if a plaintiff enter his nolle prosequi, he shall be amerced; and if an informer cause the same to be entered, the defendant shall have costs.

NON RESIDENCE is particularly applied to spiritual persons, who wilfully absent themselves for the space of one month together, or two months at different times in the year, from their benefices; for which they are liable to penalties, by the statute of non residence: but bishops, the king's chaplains, *&c.* are excepted.

NON RESIDENTIA PRO CLERICIS REGIS, is a writ directed to the bishop, charging him not to molest a clerk employed in the king's service, on account of his non residence.

NON SANE MEMORIÆ, is an exception taken to an act, declared to be done by another, importing, that it was done at a time when the party was not in his right senses.

NON-SUIT, signifies the dropping of a suit or action, or a renouncing thereof by the plaintiff or defendant, which happens most commonly upon the discovery of some error in the plaintiff's proceedings, when the cause is so far proceeded in, that the jury is ready at the bar to deliver in their verdict.

A non-suit, it is said, may be in the following cases, *viz.* where a person brings a personal action, and does not prosecute it with effect; or if, upon the trial, he refuses to stand a verdict, then he becomes non-suited; so where the plaintiff is not ready for trial at the calling and swearing of the jury, it is presumed he does not stand to proceed in his cause, and on that account the court may call him non-suited. Likewise, on a trial, when the jury comes in to deliver their verdict, and when the plaintiff is called on, to hear the same, in that case, if he does not appear after being thrice called by the crier of the court, he is non-suited; which non-suit is to be recorded by the secondary, by the direction of the court: but if he afterwards appears, before the non-suit is actually recorded, the court may take the verdict, for that is not a non-suit, till it be recorded, upon motion made by the counsel for this purpose; and then it is a part of the record, in the nature of a judgment against the plaintiff.

NON SUM INFORMATUS, *I am not informed*, a formal answer made by an attorney, who is not instructed what to say in his client's behalf; on which he is deemed to leave the cause undefended, and therefore judgment passes against his client.

NON-TENURE, is a plea in bar to a real action, by which the tenant insists, that he does not hold the lands, *&c.* mentioned in the plaintiff's count, or at least some part of it.

NON-TERM, the time of vacation between term and term, which was formerly called the days of the king's peace.

NONÆ ET DECIMÆ, were payments formerly made to the clergy, by tenants of church-farms: in which case nonæ signified a duty paid for things belonging to husbandry: and decimæ, or tithes, were claimed in right of the church.

NONCONFORMISTS, the same with dissenters. See the article DISSENTERS.

NONE, one of the seven canonical hours in the romish church, answering to three o'clock in the afternoon.

NONES, *nonæ*, in the roman calendar, the fifth day of the months January, February, April, June, August, September, November, and December; and the seventh of March, May, July, and October. March, May, July, and October, had six days in their nones; because these alone, in the antient constitution of the year by Numa, had thirty-one days apiece, the rest having only twenty-nine, and February thirty: but when Cæsar reformed the year, and made other months contain thirty-one days, he did not allot them six days of nones.

NOOSE, a name given by sportsmen to a sort

fort of horfe-hair fpringe, made to take woodcocks, and very fuccefsful when the proper precautions are taken. The noofe is made of feveral long and ftrong hairs twifted together, with a running noofe at one end, and a large knot at the other, which is to be paffed through the flit of a cleft ftick, to prevent the noofe from being pulled away when the bird is caught in it.

NORCIA, a town of Italy, in the territory of the pope, twenty-eight miles eaft of Spoletto.

NORDEN, a port town of Germany, in the circle of Weftphalia, and county of Embden, twelve miles north of Embden.

NORFOLK, a county of England, bounded by the German fea on the north and eaft; by Suffolk on the fouth, and by the fens of Lincolnfhire and the ifle of Ely on the weft.

NORFOLK, a county of Virginia, north of Carolina, and contiguous to that province.

NORKOPPING, a town of Sweden, in the province of Eaft-Gothland, ninety miles fouth-weft of Stockholm.

NORMAL, in geometry, fignifies the fame with a perpendicular, and is ufed for a line or plane that interfects another perpendicularly. See PERPENDICULAR, SUBNORMAL, LINE and PLANE.

NORMANDY, a province of France, bounded by the eaft channel on the north, by Picardy and the Ifle of France on the weft, by Orleanois on the fouth, by Britany and another part of the Eaft channel on the weft.

NORROY, the title of the third of the three kings at arms. See HERALD.

NORTGON, the palatinate of Bavaria, fo called.

NORTH, in cofmography, one of the four cardinal points. See COMPASS.

NORTH-CAPE, a promontory of the ifland of Maggero, in the province of Wardhuys, in the north of Norway; it being the moft northern cape in Europe: eaft long. 21°, and north lat. 72°.

NORTH-CURRY, a market-town of Somerfetfhire, feventeen miles fouth-weft of Wells.

NORTH-FORELAND, a cape in the ifle of Thanet, on the eaft coaft of Kent, four miles eaft of Margate.

NORTH-RIVER, a great river which rifes in Mexico, and difcharges itfelf into the gulph of Mexico, in 26° north lat.

NORTH-SEA, a name given to all that part of the Atlantic Ocean, which lies north of Terra Firma, in South America.

NORTH-WEST *paffage*. A north-weft paffage by Hudfon's Bay, into the pacific ocean, has been more than once attempted of late years, but, hitherto, without fuccefs. Some greatly doubt of the practicablenefs of fuch an enterprize, and think the obfervations made by the Ruffians give us fmall hopes. But, as they have not yet publifhed the particulars of their difcoveries, little can be faid about them. Some general things may be feen in the Phil. Tranf. N° 482. fect. 14. It appears from thence, that the Ruffians have paffed between the land of Nova Zembla, and the coaft of Afia; and, as the Dutch did formerly difcover the northern coafts of Nova Zembla, we may now be well affured, that that country is really an ifland.

NORTHALLERTON, a borough-town of the north riding of Yorkfhire, twenty-two miles north-weft of York.

It fends two members to parliament.

NORTHAMPTON, the capital of Northamptonfhire, fituated on the river Nen: weft long. 55′, and north lat. 52° 15′.

It fends two members to parliament.

NORTHAMPTON is alfo a county of Virginia, in North America, which forms the fouth part of the peninfula on the eaftern fhore of Virginia.

NORTHAUSEN, a town of Germany, in the circle of Upper Saxony, and territory of Thuringia, fifty-five miles fouth-weft of Magdeburg.

NORTHEIM, a town of the dutchy of Brunfwic, in Lower Saxony, forty-five miles fouth of Hanover.

NORTHING, in navigation, the latitude made by a fhip, in failing towards the north-pole.

NORTHLEECH, a market-town of Glocefterfhire, fifteen miles eaft of Glocefter.

NORTHUMBERLAND, a county of England, bounded on the north by Scotland, on the eaft by the German fea, on the fouth by Durham, and on the weft by Cumberland and part of Scotland.

NORTHUMBERLAND is alfo a county of Virginia, lying at the mouth of the river Patowmac.

NORTHWICH, a market-town of Chefhire, fixteen miles north-eaft of Chefter.

NORWAY, a kingdom of Europe, fituated between 4° and 30° eaft longitude, and between 58° and 72° north latitude, bounded by the Atlantic Ocean on the north

north and weſt, by ſwediſh Lapland and other provinces of Sweden on the eaſt, and by the ſea called the Categate and Schaggerac on the ſouth. It is a cold barren country ſubject to Denmark.

NORWAY-RAT, *mus norvegicus*, in zoology, an animal of the mus-kind, variegated with black and tawney. It reſembles the common rat in ſhape, but its tail is ſhorter. It breeds in the mountains of Norway, but at times comes down into the low country in vaſt troops, which deſtroy all the vegetable produce, and afterwards dying upon the place, leave a ſtench that occaſions peſtilential fevers. See the article MUS.

NORWICH, a large city of great trade in Norfolk, ſituated twenty miles weſt of Yarmouth and the German ocean: eaſt long. 1° 26′, and north lat. 52° 40′. It ſends two members to parliament.

NOSE, *naſus*, in anatomy, the primary organ of ſmelling. This varies greatly in ſize and figure in different ſubjects: anatomiſts divide its parts into external and internal; thoſe moſt obvious are the dorſum or ridge, which runs along its whole length, one part of which is more prominent than the reſt, and called the ſpine; the orbiculus, or extreme part, which in many is turned round; the alæ or pinnæ, which are the ſides; and the ſeptum, which divides the noſe into two parts, called nares or noſtrils; the hairs alſo are of this number; theſe ſerve to hinder the mucus of the noſtrils from continually running out, and to prevent inſects and extraneous ſubſtances of many kinds from getting in. To theſe may be added the common teguments, *viz.* the epidermis, the fat, and the cutis. The upper part of the noſe is rigid, and compoſed of bones; the lower part is compoſed of a number of cartilages, muſcles, and membranes.

The internal parts of the noſe are, the bones; as the oſſa naſi, the maxillaria, the os cribriforme, the oſſa ſpongioſa, the os frontale, the lachrymalia, the os palati, the vomer, and the os ſphenoides. The cartilages, which form the lower part, are connected by membranes, in order to render it flexible; the firſt of theſe form the anterior part of the ſeptum narium; there are two very large and conſpicuous ones in each of the alæ, and between theſe there are placed ſometimes two, ſometimes three, and ſometimes more ſmaller ones: the ſeptum narium is cartilaginous in its anterior and lower part; in its poſterior and upper, it is boney: and theſe parts are ſurrounded by robuſt and ſtrong membranes, which join them firmly together.

There are two paſſages from the noſtrils into the mouth, deſtined for the paſſage of air and of the mucous matter: there are ſinuſes in the maxillary, frontal, and ſphenoidal bones; and cellulæ in the os ethmoides, which increaſe the hollow of the noſe, and thus give room for the greater expanſion of the pituitary membrane. There are alſo certain inequalities and eminences of the oſſa turbinata or oſſa ſpongioſa of the noſtrils, which ſerve partly the ſame purpoſes, and partly to prevent inſects and other extraneous matter, and even the cold air, from getting immediately that way into the mouth. There is likewiſe a ſoft and vaſcular membrane, which inveſts the noſtrils, and all the ſinuſes and irregularities; this is called the membrana mucoſa, and pituitaria of Schneider, and is the primary organ of ſmelling, and the place of ſecretion of the mucus of the noſtrils. The openings of the excretory ducts of this membrane are extremely conſpicuous in the head of an ox. There are alſo a number of little glands under this membrane, eſpecially about the middle of the ſeptum, which are deſtined to the ſecretion of a mucous humour, like that of the reſt of the glands of this part.

The arteries, which are diſperſed in prodigious numbers through this membrane, ariſe from the carotids; theſe alſo ſerve for the ſecretion of this mucus. The veins are from the jugulars, by which the abundant blood not employed for theſe purpoſes, is returned. The nerves diſperſed through the membrana pituitaria, are, 1. The olfactorii, or olfactory nerves; which are ſuppoſed to be of uſe in ſmelling, and are ſufficiently obſervable, tho' they are leſs in human ſubjects than in quadrupeds. And, 2. Some branches of the fifth pair, which terminate in the hairs, and conſtitute the true organ of ſmelling.

Under the membrana pituitaria, there is alſo another very thin membrane, which ſerves to inveſt the bones and cartilages; this, where it ſurrounds the former, is called perioſteum; where the latter, perichondrium. The foramina in the noſtrils are, 1. Thoſe at the frontal, the maxillary, and the ſphenoidal ſinuſes, and the cellulæ of the os ethmoides, ſerving for the communication of theſe ſinuſes with the noſtrils. 2. The orifices of the lacrymal ducts, which open into the noſtrils. And,

And, 3. The ducts from the nose into the mouth; these, in a skeleton, are open and are obvious just behind the dentes incisores of the upper jaw; but in the dissection of recent bodies, they are not found absolutely to open into the mouth at all, nor indeed do they in living subjects, for they are closed up by the membrane of the palate.

The uses of the nose are, its giving us the sense of smelling; its serving in the great office of respiration, and in modelling the voice; in receiving the abundant humours from the eyes, and in adding to the beauty of the face. It is certain, that there is no passage to the brain for the air, much less for the powders snuffed up the nostrils: and whether there be any for transmitting a mucous humour from the brain, in order to its being discharged at the nostrils, as the antients, and as Schelvogtius, and some other of the moderns, have supposed, is not yet ascertained. See the article NOSTRILS.

Wounds of the NOSE. These are generally cured by the dry suture; but where the wound divides the cartilage, and penetrates so deep, that its lips cannot be kept in contact, by the application of sticking plasters, the true suture must be made through the skin, on each side of the wound. Though it sounds very unlike truth, that any part of the nose should be entirely separated from the rest, and afterwards united to it again, by means of sutures; yet Roonhuys, in his Observ. Chirurg. XXIV. gives an instance of a nose slit down longitudinally, and cured by suture. M. Blegny, in Zod. Med. Gall. speaks of a soldier, whose nose was cut off by a scymeter, and afterwards sewed on again so well by the surgeon, that the scar could scarcely be perceived; and M. Garengeot, in tom. iii. p. 55. of his Surgery, gives an account of a nose that was conjoined again by suture, after it was bit off. When the nasal bones are fractured, it is usual to place small tubes, of silver or lead, under them, for some time, to prevent the passage of the nose being stopped by the shooting out of the new flesh. Externally, some vulnerary balsam or glutinous powder is to be used, and covered with sticking plasters, which must be kept on with the four-headed bandage.

When this member is absolutely lost, we must supply its defects with an artificial nose of wood, or silver: such an artificial nose, painted to the life and adapted by proper springs and screws, may render the accident and deformity imperceptible.

Fracture of the NOSE. In the nose, both the bone and cartilages are subject to fractures; and if the injury is very great, they can never be so perfectly cured, but that some deformity will remain; besides, the vicinity of this part to the brain, which is frequently injured at the same time, renders cases of this kind often dangerous: a caries also, or a polypus, are no uncommon attendants on this disorder. In order to restore the bones of the nose to their proper situation, the patient is to be placed in a seat opposite to the light, and his head is to be held back, while the surgeon raises the depressed part with a spatula, a probe, or a quill, applying externally the thumb of one hand, and the fore-finger of the other. If the bones are fractured on both sides, they are to be raised on each in this manner, and the cavity of the nostrils is to be filled up with long dossils, to prevent the bones from collapsing; covering the part also, for this end, with a plaster, applying first the dressings common to recent wounds. If the bone be fractured into several splinters, they are to be reduced into their proper places, by the fingers; but if a splinter is so entirely separated from the bone, that it will not easily unite with it again, it is to be taken out with the forceps. If no caries or abscess intervene, the bones will unite in about fourteen days. If the bone should require a stronger support than what has hitherto been mentioned, one may be formed out of strong paper, either single or double, adapted to each side of the nose, and supported by bolsters, and the whole must be kept in its place by a four-headed bandage, not tied too tight. When the fracture of this part is accompanied with an external wound, after the bones are replaced, dress the wound first with dry lint, covering it with a vulnerary plaster, afterwards use balsamic medicines; but all those that are oily or greasy, are to be carefully avoided, both here, and in all other cases where the bones are injured.

Luxation of the NOSE. When the bones are separated from each other, or distorted out of their places, they are to be replaced by a probe, or quill, thrust up the nostrils, guiding the parts thus raised up, with the other hand, into their proper places, as above described, under *Fractures*; after which there is scarce

any

any thing to be done, but to let a piece of ſticking plaſter lie upon the noſe for ſome time.

Another diſorder to which the noſe is liable, is that of the preternatural cloſing of the noſtrils, which is ſometimes owing to careleſs treatment in the ſmall-pox, in the bad ſort of which the noſtrils have been known to cloſe, and adhere ſo ſtrongly to the upper lip, which is turned back at the ſame time, as to leave no poſſibility of ſhutting the mouth. In this unhappy caſe, the only relief is by the knife, ſeparating the lip from the noſe, and then opening a paſſage through each of the noſtrils, which are to be kept open with leaden pipes, and the lip preſſed down into its natural poſition by a compreſs and bandage, and this continued till the wounds are cicatrized.

For the polypus and ulcer in the noſe, ſee the articles POLYPUS and OZÆNA.

Bleeding at the NOSE. See HÆMORRHAGE.

NOSTRILS, *Nares*, in anatomy, the two apertures or cavities of the noſe, through which the air paſſes, and which ſerve to convey odours, and to carry off the pituita ſeparated in the ſinuſes of the baſe of the cranium. See the article NOSE.

NOT GUILTY, *non eſt culpabilis*, in law. See the article NON EST, &c.

NOTABILIA BONA, in law. See BONA.

NOTARICON, the third part of the jewiſh cabbala. See the article CABBALA.

NOTARY, *notarius*, ſignifies a perſon, uſually ſome ſcrivener, who takes notes, or frames ſhort draughts, of contracts, obligations, charter-parties, or other writings. At preſent we call him a notary-public, who publicly atteſts deeds, or writings, in order to make them authentic in another nation: but he is principally employed in buſineſs concerning merchants, as making proteſts of bills of exchange, &c. And noting a bill, is where he goes to take notice of a merchant's refuſal to accept or pay the ſame. See the article BILL.

The learned civilian Domat obſerves, that a diſtinction between a voluntary and contentious juriſdiction obliges us to take notice of a particular kind of officers, whoſe functions are of a very great and very frequent uſe, and who have a kind of voluntary juriſdiction, without any ſhare of the contentious juriſdiction, which are the public notaries: for the functions of notaries imply two characters of a voluntary juriſdiction; the firſt conſiſts in this, that their preſence and their ſignature ſerve as a proof of the truth of the acts which are ſued in their preſence; and that whereas in the writings which are called private, that is to ſay, which are ſigned only by the parties, their ſignatures being unknown in courts of juſtice, it is neceſſary to verify them, if they are called in queſtion: the ſignatures of notaries, who are public officers, carry along with them the truth of the acts which they ſign. And the ſecond of theſe characters conſiſts in this, that the acts which contain ſome obligations of one party towards another, being ſigned by a notary public, gives a right of mortgage on the eſtate of the perſon who is bound, which a private bond or obligation ſigned only by the party would not give.

Eccleſiaſtical NOTARIES, were officers in the firſt ages of the church, whoſe buſineſs it was to collect and preſerve the acts of martyrs.

NOTATION, in arithmetic and algebra, the method of expreſſing numbers or quantities by ſigns or characters, appropriated for that purpoſe. See NUMERATION, ALGEBRA, CHARACTER, &c.

There is one thing which deſerves particular notice, in regard to this ſubject, and that is, the great advantages that may redound to ſcience, by a happy notation, or expreſſion of our thoughts. It is owing entirely to this, and the method of denoting the ſeveral combinations of numbers, by figures ſtanding in different places, that the moſt complicated operations in arithmetic, are managed with ſo much eaſe and diſpatch. Nor is it leſs apparent, that the diſcoveries made by algebra are wholly to be imputed to that ſymbolical language made uſe of in it: for by this means we are enabled to repreſent things in the form of equations; and by variouſly proceeding with theſe equations, to trace out, ſtep by ſtep, the ſeveral particulars we want to know. Add to all this, that by ſuch a notation, the eyes and imagination are alſo made ſubſervient to the diſcovery of truth; for the thoughts of the mind riſe up and diſappear, according as we ſet ourſelves to call them into view; and therefore, without ſome particular method of fixing and aſcertaining them as they occur, the retrieving them when out of ſight would be no leſs painful, than the very firſt exerciſe of deducing them one from another. As, therefore, we have, frequent occaſion to look back upon the diſcoveries

already made, could theſe be no otherwiſe brought into view, than by the ſame courſe of thinking in which they were firſt traced, ſo many different attentions at once muſt needs greatly diſtract the mind, and be attended with infinite trouble and fatigue. But now, the method of fixing and aſcertaining our thoughts by a happy and well choſen notation, entirely removes all thoſe obſtacles; for thus, when we have occaſion to turn to any former diſcovery, as care is taken all along to delineate them in proper characters, we need only caſt our eye on that part of the proceſs where they ſtand expreſſed, which will lay them at once open to the mind in their true and genuine form. By this means we can take, at any time, a quick and ready ſurvey of our progreſs, and running over the ſeveral concluſions already gained, ſee more diſtinctly what helps they furniſh towards obtaining thoſe others we are ſtill in purſuit of. Nay, farther, as the amount of every ſtep of the inveſtigation lies before us, by comparing them variouſly among themſelves, and adjuſting them one to another, we come at length to diſcern the reſult of the whole, and are enabled to form our ſeveral diſcoveries into an uniform and well-connected ſyſtem of truths, which is the end and aim of all our inquiries.

NOTE, *nota*, is uſed for a character or abbreviature, ſerving to denote or expreſs ſomething in a little compaſs.

NOTES, in muſic, characters which mark the ſounds; *i. e.* the elevations and fallings of the voice, and the ſwiftneſs and ſlowneſs of its motions. In general, under notes are comprehended all the ſigns or characters uſed in muſic, though in propriety the word only implies the marks which denote the degrees of gravity and acuteneſs to be given to each ſound. See SOUND, CHARACTER, and GRAVITY.

The Greeks uſed the common letters of their alphabet for muſical notes, and in regard more notes were needed than they had letters, the defect was ſupplied by the different ſituation of the letters: thus the ſame letter Π expreſſed different notes in all the following forms Π, ∐, ⊏, ⊐, Γ, ⅂. For every ſeveral mode they had eighteen ſigns. Now Alypius gives us ſigns for fifteen different modes, which, with the differences of the genera, and the diſtinction between voice and inſtrument, Mr. Malcolm makes 1620 notes. Not that they had ſo many diſtinct characters, but the ſame characters had different ſignifications upon different occaſions, as φ in the diatonic genus is lychanos hypatôn of the lydian mode, and hypate meſon of the phrygian, and ſo of others.

The Latins, in the time of Boëthius, had eaſed themſelves of this needleſs burden, and only uſed fifteen letters of their alphabet for notes. Theſe, pope Gregory, conſidering that the ſecond octave was in effect the ſame with the firſt, and that the order was the ſame in the upper and lower octave of the gamut, afterwards reduced to ſeven, which were to be repeated in a different character: at length, in the eleventh century, Guido Aretine, a benedictine monk, inſtead of the letters ſubſtituted ſix ſyllables, *ut*, *re*, *mi*, *fa*, *ſol*, *la*, placing them in different lines, and marking them with points. Laſtly, it was thought proper to add notes likewiſe in the ſpaces. See the article GAMUT.

Hitherto the notes only ſerved to expreſs the degrees of tune: they were all of equal value as to time, till about the year 1330, when John De Muris, doctor of Paris, gave different figures to different points, to expreſs the quantity of time each was to be dwelt upon. See TIME.

There are three things to be conſidered in theſe notes, 1. The quantity, *i. e.* the ſize and figure of the head. 2. The quality, *i. e.* the colour of the head, whether it be white or black, full or open. 3. The properties, as the Italians expreſs themſelves, *viz.* whether the note is accompanied with a virgula or comma, or not. It muſt likewiſe be conſidered whether the notes be ſeparate and diſtinct, or bound together. Each of theſe, *viz.* the quantity, quality, &c. may be ſeen under the articles MINIM, CROTCHET, &c.

Mathematicians compute that one may make 720 changes or varieties with ſix notes, without ever repeating the ſame twice; and that of the notes of each octave, one may make 40320 different tunes or ſongs. See the article TUNE.

NOTE is likewiſe uſed for a mark made in a book or writing where there occurs ſomething remarkable and worthy of particular notice: as alſo for an obſervation or explication of ſome paſſage in an author added in the margin, at the bottom of the page, or elſewhere, by an editor, in which ſenſe it ſtands contradiſtinguiſhed to text. The notes make the principal difference in the editions of claſſic, &c.

&c. authors. We have Virgil, Horace, Terence, &c. with Dacier's notes, Dauphin's notes, notes variorum, &c.

NOTE is alfo a minute, or fhort writing, containing fome article of bufinefs, in which fenfe we fay, promiffary note, note of hand, bank note, &c.

To NOTE *a bill.* See the articles NOTARY, PROTEST, and BILL.

NOTE *of a fine,* in law, an abftract of the fine or contract made by the chirographer, before the fame is engroffed.

NOTHÆ CASTÆ, in anatomy, the five loweft ribs on each fide. They are called baftard or fpurious ribs, in regard they do not join with the breaft-bone as the other ribs do; nor are they, like the reft, bony, but cartilaginous. See RIBS.

NOTHING, *nihil.* The fchoolmen diftinguifh between nothing taken ftrictly, being that which is impoffible, or implies a contradiction; and nothing taken more generally, being applied both to what is poffible and impoffible. Again, they diftinguifh nothing into negative, which is the abfence of reality in any fubject; and privative, which is the abfence of reality in a fubject capable thereof, or wherein it ought to be found.

NOTHUS, νοθος, fignifies fpurious or baftard, whence it is figuratively applied by phyficians, &c. to fuch difeafes, as though in refpect of a fimilitude of fymptoms, &c. they have the fame denomination as fome others, yet are of a different origin, feat, or the like, from the fame.

NOTICE, in law, is defined to be the making of fomething known, which a man might be ignorant of before: and it has divers effects in our law; for thereby the party giving the fame, may reap a benefit which he otherwife fhould not have had; and by this means the perfon to whom it is given, is liable to fome charge or action to which without it he had not been fubject. Notice is in feveral refpects required to be given in order to juftify proceedings; yet none is bound by law to give notice to another of what fuch other may inform himfelf. In the cafe of a promife, it has been held, that where a penalty is to be recovered, there notice is neceffary; but where the plaintiff fues for damages, the defendant has fufficient notice, by the action brought againft him. Likewife, if a perfon is obliged by an affumpfit in general to do a certain thing to another, the perfon to whom the promife is made muft give notice when he would have him perform it; and yet where another perfon is to to it, in fuch cafe, he to whom the thing is to be done fhall not be compelled to give notice to that third perfon, as to the doing thereof: but the party muft at his peril procure it. Where one enters into a bond to make fuch an affurance as the counfel of the obligee fhall advife, the obligor is to have notice that the obligee's counfel has advifed the fame. If a thing lies in the knowledge of the plaintiff in an action, there ought to be notice given of it to the defendant. Upon all writs of inquiry of damages, either in real or perfonal actions, notice muft be given to the other party in the fuit; and want of notice on divers occafions, is often the caufe of arreft of judgment, &c.

NOTION, in logic, an idea or reprefentation of any thing in the mind. See the article IDEA.

This term, and the word idea, are often taken in the fame fenfe; but the ingenious bifhop Berkeley obferves, that we cannot ftrictly be faid to have an idea of an active being, or of an action, although we may be faid to have a notion of them. I have, fays he, fome knowledge or notion of my mind, and its acts about ideas, inafmuch as I know or underftand what is meant by thefe words. What I know, that I have fome notion of. However, continues our author, if the world will have it fo, the terms idea and notion may be ufed convertibly. By yet it conduces to clearnefs and propriety that we diftinguifh things very different by different names. It is alfo to be remarked, that in all relations including an act of the mind we cannot fo properly be faid to have an idea, but rather a notion of the relation or habitudes between things: but if in the modern way the word idea is extended to fpirits, relations, and acts, this is after all an affair of a verbal concern.

It is an eftablifhed opinion among fome philofophers, that there are in the underftanding certain innate principles, fome primary or common notions, κοιναι εννοιαι, as it were ftampt upon the mind of man, and which the foul receives in its very firft being, and brings into the world with it. But this opinion is accurately difcuffed, and refuted by Mr. Locke, who fhews how men, barely by the ufe of their natural faculties, may attain to all the knowledge they have, without any fuch original notions or principles.

principles. See IDEA and KNOWLEDGE.

NOTITIA, in literary hiftory, a book that gives an account of a particular country, city, or other place: fuch is the Notitia Imperii Romani, Notitia Romæ Antiquæ, &c.

NOTO, the capital of a province of the fame name, in Sicily, twenty miles fouth of Syracufe: eaft long. 15°, north lat. 37° 15′.

NOTONECTA, the BOAT-FLY, in the hiftory of infects, a genus of infects of the clafs of the fcleroptera, the roftrum or fnout of which is inflected, the antennæ are very fhort; the wings, which are four in number, are cruciated, and the legs are formed for fwimming.

NOTORIOUS, fomething that is publicly known, and therefore needs no proof.

NOTRE DAME, OUR LADY, an appellation frequently given to the Holy Virgin: and hence we meet with churches of notre dame, as that at Paris; alfo feafts, nunneries, &c. of notre dame.

NOTTEBURG, a city of Ruffia, fituated on an ifland in the lake Lodoga, twenty-five miles eaft of Peterfburg.

NOTTINGHAM, the capital of Nottinghamfhire, fituated about a mile north of the river Trent: weft longitude 1° 5′, north latitude 53°.

It fends two members to parliament.

NOVA, NEW, fomething oppofed to old. Hence,

NOVA-SCOTIA, New SCOTLAND. See the article SCOTLAND.

NOVA-ZEMBLA, or Newland, called by the Dutch the ifland of Weygats, is fituated in the frozen ocean, between 50° and 80° eaft longitude, and between 70° north latitude and the north pole; it is feparated from the province of Samoieda, in Ruffia, by the ftraits of Weygats; but whether it be an ifland, or part of fome great continent, is uncertain, no fhips having ever paffed to the northward of it.

NOVALE, in our antient cuftoms, fignifies land newly ploughed, that had not been tilled before in the memory of man. Novale is alfo fometimes ufed for fallow land.

NOVARA, the capital of the Novarefe, in the dutchy of Milan, forty miles weft of Milan.

NOVATIANS, a chriftian fect which fprang up in the third century, fo called from Navatian, a prieft of Rome, or Novatus, an african bifhop, who feparated from the communion of pope Cornelius, whom Novatian charged with a criminal lenity towards thofe who had apoftatized during the perfecution of Decius. He denied the church's power of remitting mortal fins, upon the offender's repentance; and at laft went fo far as to deny that the apoftles could ever hope for pardon even from God himfelf. Novatus coming to Rome, joined with the followers of Novatian, and added to thefe rigid doctrines another, which was the unlawfulnefs of fecond marriages, againft which this became as fevere as againft apoftates; denying communication to fuch as married a fecond time after baptifm, and treating widows who married again, as adultereffes. The two leaders were profcribed and declared heretics, not for excluding penitents from communion, but for denying that the church had the power of remitting fins.

NOVATION, or INNOVATION, in the civil law, denotes the change of one kind of obligation for another; as when a promife is accepted inftead of a written obligation. See the article OBLIGATION.

NOVEL, in the civil law, a term ufed for the conftitutions of feveral emperors, as of Juftin, Tiberius, Leo, and more particularly of thofe of Juftinian. The conftitutions of Juftinian were called novels, either from their producing a great alteration in the face of the antient law, or becaufe they were made on new cafes, and after the revifal of the antient code, compiled by order of that emperor. Thus the conftitutions of the emperors Theodofius, Valentinian, Marcian, &c. were alfo called novels, on account of their being publifhed after the theodofian code.

NOVEL, in matters of literature, a fictitious hiftory of a feries of furprizing and entertaining events in common life, wherein the rules of probability are or ought to be ftrictly preferved; in which it differs from a romance, where the hero and heroine is fome prince and princefs, and the events which lead to the cataftrophe, are in general highly abfurd and unnatural. The beft novels are thofe which by means of a well told ftory, convey a number of noble and elevated fentiments, and inftruct the reader in the knowledge of mankind.

NOVEL ASSIGNMENT, in law, an affignment of time, place, or the like, in an action of trefpafs, otherwife than it was before affigned.

This

This is practised, where an action of trespass being brought for breaking a close, generally; and the defendant, in his plea, justifies himself in a place where no trespass was committed; in which case, the plaintiff assigns the close, or place where the trespass was done, and to this the defendant must plead.

NOVEL DISSEISIN. See the article ASSISE *of novel disseisin.*

NOVELLARA, a town of Italy, in the dutchy of Mantua, twenty miles south of the city of Mantua.

NOVEMBER, in chronology, the eleventh month of the julian year, consisting only of thirty days: it got the name of November, as being the ninth month of Romulus's year, which began with March. See the articles MONTH and YEAR.

NOVEMSILES, or NOVENSILES DII, in roman antiquity, certain gods brought to Rome by the Sabines, and so called as being nine in number, *viz.* Lara, Vesta, Minerva, Feronia, Concord, Fidelity, Fortune, Chance, Health.

Some understand, by novensiles dii, new created gods, or those whose worship was brought from some foreign country to Rome; whilst others pretend, they signified the nine muses.

NOVEMVIRI, the nine magistrates of Athens, more usually called archons. See the article ARCHON.

NOVENDIALE, or NOVEMDIALE, a nine-days solemnity, observed with sacrifices by the antient Romans, to divert the mischiefs with which they were threatened with prodigies, and to appease the anger of the gods.

NOVI, a town of Italy, twenty-five miles north-west of Genoa.

NOVIBAZAR, a city of european Turky, in the province of Servia, 100 miles south of Belgrade: east long. 22°, north lat. 43° 30′.

NOVICE, in general, denotes a person not yet skilled, or experienced, in any art or profession.

In the countries where monachism prevails, novices are the candidates, or probationers, for a religious life. See the article MONK.

This noviciate lasts a year, at least; in some monasteries more; after which the novices, by professing themselves and taking the vows, become dead to the world in a civil sense.

NOVIGRAD, a town of Hungary, sixteen miles north of Buda, in 19° 5′ east longitude, and 48° north latitude.

NOVIGRAD is also a town of Dalmatia, in 17° 30′ east longitude, and 44° 30′ north latitude.

NOUN, *nomen*, in grammar, a part of speech, which signifies things without any relation to time; as a man, a house, sweet, bitter, *&c.*

The words which signify the simple objects of our thoughts are, in all languages but the English, called names: but our first formers of grammar, either out of affectation or folly, corrupted the latin word *nomen*, into the barbarous sound *noun*, as it is called in the vulgar grammars. And thus they have made a division of names, calling the name of a thing or substance, a noun-substantive; and that which signifies the manner or quality, a noun-adjective. See NAME, SUBSTANTIVE, and ADJECTIVE.

Nouns are also divided into proper and appellative. See the articles PROPER and APPELLATIVE.

NOVOGOROD, the capital of a province of the same name in Muscovy, situated on the river Wolcoff, 130 miles south-east of Petersburg: east long. 34°, north lat. 58°.

It is an archbishop's see, and has 180 churches and monasteries.

NOVOGRODECK, a city of Lithuania, in Poland: east long. 25° 30′, north lat. 53° 45′.

NOURISHMENT, or NUTRITION, in physiology. See NUTRITION.

NOWED, in heraldry, signifies knotted, from the latin *nodatus*; being applied to the tails of such creatures as are very long, and sometimes represented in coat-armour, as if tied up in a knot.

NOYA, a town of Galicia, in Spain, situated in the river Tamara, fifteen miles west of Compostella.

NOYON, a town of the isle of France, fifty miles north-east of Paris.

NUBECULA, in surgery and medicine, a distemper of the eye, otherwise called leucoma. See the article LEUCOMA.

NUBECULA is also used for a matter in form of a cloud suspended in the middle of the urine. See the article URINE.

NUBIA, a country of Africa, bounded by the desart of Barca, on the north; by Egypt and Abyssinia, on the east; by the Lower Ethiopia, on the south; and by the desarts of Africa, on the west.

NUBILES ANNI, the legal age of marriage. See the article MARRIAGE.

NUCHA, in anatomy, the nape of the neck. See the article NECK.

NUCIFEROUS TREES, fuch as bear nuts. See the articles TREE and NUT.

NUCIFRAGA, in ornithology, a bird otherwife called coccothrauftes. See the article COCCOTHRAUSTES.

NUCKIANÆ GLANDULÆ, in anatomy, a number of fmall glands, fituated between the abducent mufcle of the eye, and the upper part of the os jugale. See the articles EYE, GLAND, *&c.*

NUCLEUS, in general, denotes the kernel of a nut, or even any feed inclofed within a hufk.

The term nucleus is alfo ufed for the body of a comet, otherwife called its head. See the article COMET.

Among the antient architects, nucleus fignified the middle flooring, which confifted of a ftrong cement, over which they laid the pavement bound with mortar.

NUDE COMPACT, *nudum pactum*, in law, a contract made without any confideration. See the article CONTRACT.

NUDE MATTER, in law, fignifies a bare allegation of fomewhat done.

NUDIPEDALIA, among the antients, a feftival in which all were obliged to walk bare-footed. This was done on account of fome public calamity; as the plague, famine, an intenfe drought and the like. It was likewife ufual for the Roman matrons, when any fupplication and vows were to be made to the goddefs Vefta, to walk in proceffion to her temple bare-footed.

NUDITIES, in painting and fculpture, denotes thofe parts of an human figure which are not covered with any drapery; or thofe parts where the carnation appears.

NUL TIEL RECORD, in law, is what the plaintiff generally pleads, on the defendant's pleading matter of record in bar of the action brought by the plaintiff.

NULLITY, in law, fignifies any thing that is null or void: thus there is a nullity of marriage, where perfons marry within the degrees, or where infants marry without confent of their parents or guardians. See the article MARRIAGE.

NUMBER, *numerus*, in arithmetic, an affemblage of feveral units, or things of the fame kind.

Number, fays Malcolm, is either abftract or applicate; abftract, when referred to things in general, without attending to their particular properties; and applicate, when confidered as the number of a particular fort of things, as yards, trees, or the like.

When particular things are mentioned, there is always fomething more confidered than barely their numbers; fo that what is true of numbers in the abftract, or when nothing but the number of things is confidered, will not be true, when the queftion is limited to particular things: for inftance, the number two is lefs than three; yet two yards is a greater quantity than three inches; and the reafon is, becaufe regard muft be had to their different natures as well as number, whenever things of a different fpecies are confidered; for though we can compare the number of fuch things abftractedly, yet we cannot compare them in any applicate fenfe. And this difference is neceffary to be confidered, becaufe upon it the true fenfe, and the poffibility or impoffibility of fome queftions depend.

Number is unlimited in refpect of increafe, becaufe we can never conceive a number fo great, but ftill there is a greater. However, in refpect of decreafe, it is limited; unity being the firft and leaft number, below which therefore it cannot defcend.

Kinds and diftinctions of NUMBERS. Mathematicians, confidering number under a great many relations, have eftablifhed the following diftinctions.

Broken numbers are the fame with fractions. See the article FRACTION.

Cardinal numbers are thofe which exprefs the quantity of units, as 1, 2, 3, 4, *&c.* whereas ordinal numbers are thofe which exprefs order, as 1ft, 2d, 3d, *&c.*

Compound number, one divifible by fome other number befides unity; as 12, which is divifible by 2, 3, 4, and 6. Numbers, as 12 and 15, which have fome common meafure befides unity, are faid to be compound numbers among themfelves.

Cubic number is the product of a fquare number by its root: fuch is 27, as being the product of the fquare number 9, by its root 3. All cubic numbers whofe root is lefs than 6, being divided by 6, the remainder is the root itfelf: thus $27 \div 6$ leaves the remainder 3, its root; 216, the cube of 6, being divided by 6, leaves no remainder; 343, the cube of 7, leaves a remainder 1, which, added to 6, is the cube root; and 512, the cube of 8, divided by 6, leaves a remainder 2, which, added to 6, is the cube root. Hence the remainders of the divifions of the cubes above 216, divided by 6, being added

added to 6, always gives the root of the cube so divided, till that remainder be 5, and consequently 11, the cube-root of the number divided. But the cubic numbers above this, being divided by 6, there remains nothing, the cube-root being 12. Thus the remainders of the higher cubes are to be added to 12, and not to 6; till you come to 18, when the remainder of the division must be added to 18; and so on *ad infinitum*.

Determinate number is that referred to some given unit, as a ternary or three: whereas an indeterminate one, is that referred to unity in general, and is called quantity.

Homogeneal numbers, are those referred to the same unit; as those referred to different units are termed heterogeneal.

Whole numbers are otherwise called integers. See the article INTEGER.

Rational number is one commensurable with unity; as a number, incommensurable with unity, is termed irrational or a surd. See the article SURD.

In the same manner a rational whole number, is that whereof unity is an aliquot part; a rational broken number, that equal to some aliquot part of unity; and a rational mixed number, that consisting of a whole number and a broken one.

Even number, that which may be divided into two equal parts without any fraction, as, 6, 12, &c. The sum, difference, and product of any number of even numbers, is always an even nnmber.

An evenly even number, is that which may be measured, or divided, without any remainder, by another even number, as 4 by 2.

An unevenly even number, when a number may be equally divided by an uneven number, as 20 by 5.

Uneven number, that which exceeds an even number, at least by unity, or which cannot be divided into two equal parts, as 3, 5, &c.

The sum or difference of two uneven numbers makes an even number; but the factum of two uneven ones makes an uneven number.

If an even number be added to an uneven one, or if the one be subtracted from the other, in the former case the sum, in the latter the difference, is an uneven number; but the factum of an even and uneven number is even.

The sum of any even number of uneven numbers is an even number; and the sum of any uneven number of uneven numbers is an uneven number.

Primitive or prime numbers, are those only divisible by unity, as 5, 7, &c. And prime numbers among themselves, are those which have no common measure besides unity, as 12 and 19.

Perfect number, that, whose aliquot parts added together, make the whole number, as 6, 28; the aliquot parts of 6 being 3, 2, and 1, = 6; and those of 28, being 14, 7, 4, 2, 1, = 28.

Imperfect numbers, those whose aliquot parts, added together, make either more or less than the whole. And these are distinguished into abundant and defective; an instance in the former case is 12, whose aliquot parts 6, 4, 3, 2, 1, make 16; and in the latter case 16, whose aliquot parts 8, 4, 2, and 1, make but 15.

Plain number, that arising from the multiplication of two numbers, as 6, which is the product of 3 by 2; and these numbers are called the sides of the plane.

Square number, is the product of any number multiplied by itself; thus 4, which is the factum of 2 by 2, is a square number.

Every square number added to its root makes an even number.

Polygonal, or polygonous numbers, the sums of arithmetical progressions beginning with unity: these, where the common difference is 1, are called triangular numbers; where 2, square numbers; where 3, pentagonal numbers; where 4, hexagonal numbers; where 5, heptagonal numbers, &c. See POLYGONAL.

Pyramidal numbers: the sums of polygonous numbers, collected after the same manner as the polygons themselves, and not gathered out of arithmetical progressions, are called first pyramidal numbers: the sums of the first pyramidals are called second pyramidals, &c.

If they arise out of triangular numbers, they are called triangular pyramidal numbers; if out of pentagons, first pentagonal pyramidals.

From the manner of summing up polygonal numbers, it is easy to conceive how the prime pyramidal numbers are found, *viz.* $\frac{(a-2)n^3+3n^2-(a-5)n}{6}$ expresses all the prime pyramidals.

Golden NUMBER, in chronology. See the article GOLDEN.

NUMBER, in grammar, a modification of nouns, verbs, &c. to accommodate them to the varieties in their objects, consider-ed

ed with regard to number. See the articles NOUN and VERB.

Nouns or names agreeing to feveral things, may be confidered either as applied to one of thofe things fingularly, or to a number of them; and thofe confidered either as feveral, or as united. To diftinguifh thefe cafes, two numbers have been invented, the fingular and plural.

When a noun indicates an object confidered as fingle, or alone, or a number of them confidered as united together, it is faid to be of the fingular number, as a plant, an army, a church. When it indicates feveral objects, and thofe as diftinct, it is of the plural number, as plants, armies, churches: and when I fpeak of myfelf as making a part of feveral others, inftead of faying I, it is proper to fay we, *&c.*

The Greeks have a third number which they call dual number, as fignifying two: the Hebrews have fomething like it; but then it only takes place when the words fignify a thing double, either by nature, as the hands, eyes, *&c.* or by art, as fciffars, tongs, *&c.* As to common and appellative names, they feem all naturally to require a plural number, yet are there feveral which have none, as the name of gold, fteel, *&c.*

The difference of numbers in nouns is expreffed by a difference of termination. In Englifh the fingular is ufually converted into plural by adding s, as plant, plants; book, books, *&c.* Where the pronunciation requires it, as where the fingular ends in s or x, fh or ch, it is ufually done by the addition of es, inftead of s. Very often the plural is formed by en, as from ox is formed the plural oxen; and from man, men; brother, brethren, *&c.* Thofe nouns whofe fingulars end in f, or fe, form the plural by ves; as calf, calves; loaf, loaves; wife, wives, *&c.* However, the formation of the plural of many words can be reduced to no rule at all, being mere irregulars; as from moufe is formed the plural mice; from foot, feet, *&c.* And in many words there is no difference of number; as in fl * p, deer, *&c.* Again, fome words have no fingular numbers; as afhes, bellows, lungs, breeches, *&c.* and others no plural; as the names of countries, virtues and vices, metals, herbs, and corn. The plurals of adjectives, tho' varied from the fingular in moft languages, yet in englifh are generally the fame.

NUMBERS, in poetry, oratory, mufic, *&c.* are certain meafures, proportions, or cadences, which render a verfe, period, or fong, agreeable to the ear. See METRE.

Poetical numbers confift in a certain harmony in the order, quantities, *&c.* of the feet and fyllables; which make the piece mufical to the ear, and fit for finging, for which all the verfes of the antients were intended. See the articles MEASURE and RHYHME.

It is of thefe numbers Virgil fpeaks in his ninth Eclogue, when he makes Lycidas fay, *Numeros memini, fi verba tenerem*; meaning, that although he had forgot the words of the verfes, yet he remembered the feet and meafure of which they were compofed.

Rhetorical, or profaic numbers, are a fort of fimple unaffected harmony, lefs glaring than that of verfe, but fuch as is perceived and affects the mind with pleafure.

The numbers are that by which the ftyle is faid to be eafy, free, round, flowing, *&c.* Numbers are things abfolutely neceffary in all writing, and even in all fpeech. Hence Ariftotle, Tully, Quintilian, *&c.* lay down abundance of rules as to the beft manner of intermixing dactyles, fpondees, anapefts, *&c.* in order to have the numbers perfect. The fubftance of what they have faid, is reducible to what follows. 1. The ftyle becomes numerous by the alternate difpofition and temperature of long and fhort fyllables, fo as that the multitude of fhort ones neither render it too hafty, nor that of long ones too flow and languid: fometimes, indeed, long and fhort fyllables are thrown together defignedly without any fuch mixture, to paint the flownefs or celerity of any thing by that of the numbers; as in thefe verfes of Virgil:

Illi inter fefe magna vi brachia tollunt;

and

Radit iter liquidum, celeres neque commovet alas.

2. The ftyle becomes numerous by the intermixing words of one, two, or more fyllables; whereas the too frequent repetition of monofyllables renders the ftyle pitiful and grating. 3. It contributes greatly to the numeroufnefs of a period to have it clofed by magnificent and well founding words. 4. The numbers depend not only on the noblenefs of the words in the clofe, but of thofe in the whole tenor of the period. 5. To have the period flow eafily and equally; the

the harſh concurrence of letters and words is to be ſtudiouſly avoided, particularly the frequent meeting of rough conſonants; the beginning the firſt ſyllable of a word with the laſt of the preceding; the frequent repetition of the ſame letter or ſyllable; and the frequent uſe of the like ending words. Laſtly, the utmoſt care is to be taken leſt, in aiming at oratorial numbers, you ſhould fall into poetical ones; and inſtead of proſe, write verſe.

Book of NUMBERS, the fourth book of the Pentateuch, taking its denomination from its numbering the families of Iſrael.

A great part of this book is hiſtorical, relating to ſeveral remarkable paſſages in the Iſraelites march through the wilderneſs. It contains a diſtinct relation of their ſeveral movements from one place to another, or the two and forty ſtages through the wilderneſs, and many other things, whereby we are inſtructed and confirmed in ſome of the weightieſt truths that have immediate reference to God and his providence in the world. But the greateſt part of this book is ſpent in enumerating theſe laws and ordinances, whether civil or ceremonial, which were given by God, but not mentioned before in the preceding books.

NUMB-FISH, the ſame with the torpedo or cramp-fiſh. See the article TORPEDO.

NUMENIUS, in ornithology, a genus of birds of the order of the ſcolopaces; the beak of which is of a figure approaching to a cylindric one, it is obtuſe at the point, and is longer than the toes, the feet have each 4 toes connected together. This genus comprehends the curlew, the woodcock, the great plover, and the ſnipe. See the article CURLEW, *&c.*

NUMERAL LETTERS, thoſe letters of the alphabet which are generally uſed for figures, as I, V, X, L, C, D, M. See the article NUMERATION.

NUMERAL CHARACTERS. See the article CHARACTER.

NUMERALS, in grammar, thoſe words which expreſs numbers; as 6, 8, 10, *&c.*

NUMERATION, or NOTATION, in arithmetic, the art of expreſſing in characters any number propoſed in words; or of expreſſing in words any number propoſed in characters.

The characters uſed to expreſs numbers by, are either the ten numeral figures of the Arabians, *viz.*

one,	two,	three,	four,	five,	ſix,	ſeven,	eight,	nine,	cypher;
1	2	3	4	5	6	7	8	9	0

Or the ſeven numeral letters of the Romans,

one,	five,	ten,	fifty,	hundred,	five-hundred,	thouſand.
I	V	X	L	C	D	M

Each of which figures, beſides their own ſingle value, receives ſeveral denominations according to their place and order. A number has ſo many places as there are figures in it, as 36487 is the number of five places. The order in whole numbers is from the right to the left. The value of places decreaſes in a decuple proportion: for every place to the left is ten times the value of the next place to the right. Each place alſo has its name; and thoſe names, for the more eaſy reading of large numbers, are diſtinguiſhed by periods, half-periods, *&c.*

For as a place } is { ten } times the value of that before it.
So a half-period } is { a thouſand } times the value of that before it.
And a period } is { a million } times the value of that before it.

A cypher is of itſelf inſignificant; but by its place alters the value of the ſubſequent figure: and, ſince the value of each place is ten times the value of the next before it, it is certain

that { 1, 2, 3, *&c.* } in the firſt place, is { 10, 20, 30, *&c.* } in the ſecond, { 100, 200, 300, *&c.* } in the third, { 1000, 2000, 3000, *&c.* } in the fourth, *&c.*

The value of each figure in any rank of numbers, how large ſoever, is readily found by the following rule.

Begin at units, ſet a point under the ſeventh place; then reckoning that as one, count forwards, and ſet another under the next ſeventh place, ſo continue to the end.

Then the	first second third fourth, &c.	point from units stands under	millions, billions, trillions, quadrillions, &c.

As is evident in the following example,

Periods	Quadril.		Trillions		Billions		Millions		Units	
Half-periods	th.	units	th.	units	th.	units	th.	units	th.	units
Degrees	c x u	c x u	c x u	c x u	c x u	c x u	c x u	c x u	c x u	c x u
Figures	1 2 3	4 5 6	7 8 9	0 9 8	7 6 5	4 3 2	1 0 1	2 3 4	5 6 7	8 9 1

By this means you may have as clear a notion of, and may as eafily read a number of feventy places as of feven.

NUMERATOR *of a fraction.* See the article FRACTION.

NUMERICAL, NUMEROUS, or NUMERAL, fomething belonging to numbers; as numerical algebra is that which makes ufe of numbers inftead of letters of the alphabet. Alfo, numerical difference, is the difference whereby one individual is diftinguifhed from another. Hence a thing is faid to be numerically the fame, when it is fo in the ftricteft fenfe of the word. See the articles UNITY and IDENTITY.

NUMERO, in commerce. See the article BOOK OF NUMERO'S.

NUMIDIA, the antient name of Biledulgerid, in Africa. See BILEDULGERID.

NUMISMATOGRAPHIA, a term ufed for the defcription and knowledge of antient medals and coins, whether of gold, filver, or brafs.

NUMMUS, or NUMUS, among the Romans, a piece of money otherwife called feftertius. See MONEY and SESTERCE.

NUN, a woman, in feveral chriftian countries, who devotes herfelf, in a cloifter or nunnery, to a religious life. See the article MONK.

There were women in the antient chriftian church, who made public profeffion of virginity before the monaftic life was known in the world, as appears from the writings of Cyprian and Tertullian. Thefe, for diftinction's fake, are fometimes called ecclefiaftical virgins, and were commonly enrolled in the canon or matricula of the church. They differed from the monaftic virgin chiefly in this, that they lived privately in their father's houfes, whereas the others lived in communities: but their profeffion of virginity was not fo ftrict as to make it criminal in them to marry afterwards, if they thought fit. As to the confecration of virgins, it had fome things peculiar in it: it was ufually performed publicly in the church by the bifhop. The virgin made a public profeffion of her refolution, and then the bifhop put upon her the accuftomed habit of facred virgins. One part of this habit was a veil called the facrum velamen, another was a kind of mitre or coronet worn upon the head. At prefent, when a woman is to be made a nun, the habit, veil, and ring of the candidate are carried to the altar, and fhe herfelf, accompanied by her neareft relations, is conducted to the bifhop, who, after mafs and an anthem, the fubject of which is, "that fhe ought to have her lamp lighted, becaufe the bridegroom is coming to meet her," pronounces the benediction: then fhe rifes up, and the bifhop confecrates the new habit, fprinkling it with holy-water. When the candidate has put on her religious habit, fhe prefents herfelf before the bifhop, and fings, on her knees, *ancilla Chrifti fum, &c.* then fhe receives the veil, and afterwards the ring, by which fhe is married to Chrift; and laftly the crown of virginity. When fhe is crowned, an anathema is denounced againft all who fhall attempt to make her break her vows. The feveral orders of nuns in the romifh and greek churches, are mentioned under feparate articles.

NUNCIO, or NUNTIO, an embaffador from the pope to fome catholic prince or ftate, or a perfon who attends on the pope's behalf at a congrefs, or an affembly of feveral embaffadors.

The nuncio has a jurifdiction, and may delegate judges in all the ftates where he refides, except in France, where he has no authority but that of a fimple embaffador. See the article EMBASSADOR.

NUNCUPATIVE, in the ſchools, ſomething that is only nominal, or has no exiſtence but in name.

NUNCUPATIVE WILL, denotes a laſt will or teſtament, only made verbally, and not put in writing. See the articles WILL and TESTAMENT.

NUNDINAL, NUNDINALIS, a name which the Romans gave to the eight firſt letters of the alphabet, uſed in their calendar.

This ſeries of letters, A, B, C, D, E, F, G, H, is placed and repeated ſucceſſively from the firſt to the laſt day of the year: one of theſe always expreſſed the market-days, or the aſſemblies called nundinæ, *quaſi novendinæ*, becauſe they returned every nine days. The country people, after working eight days ſucceſſively, come to town the ninth, to ſell their ſeveral commodities, and to inform themſelves of what related to religion and government. Thus the nundinal day being under A on the firſt, ninth, ſeventeenth, and twenty-fifth days of January, *&c.* the letter D will be the nundinal letter of the year following. Theſe nundinals bear a very great reſemblance to the dominical letters, which return every eight days, as the nundinals did every nine. See DOMINICAL LETTER.

NUPER OBIIT, in law, a writ that lies for a ſiſter and coheir, who is deforced by her coparcener of lands, *&c.* of which their anceſtor died ſeiſed in fee. Here, if one ſiſter deforces another of land that is held in tail, the other ſiſter ſhall bring a formedon againſt her, and not this writ, *&c.* But a writ of rationabili parte lies where the anceſtor was once ſeiſed, yet died not ſeiſed of the poſſeſſion, but the reverſion.

NUPTIAL RITES, the ceremonies attending the ſolemnization of marriage, which are different in different ages and countries. See the article MARRIAGE.

The nuptial rites among the Jews are performed in the following manner. The bridegroom and bride are placed under a canopy, each of them covered with a black veil. The rabbin of the place, the chanter of the ſynagogue, or the neareſt relation of the huſband, takes a cup full of wine, and having pronounced a benediction, he preſents the cup to the bridegroom, and then to the bride, who juſt taſte of the liquor. Afterwards the bridegroom puts a ring upon the bride's finger, ſaying, "By "this ring thou art my ſpouſe, *&c.*" Then they read the contract of marriage, which the bridegroom puts into the hands of the bride's relations: afterwards they rehearſe ſix bleſſings; the married couple drink wine, and the veſſel is thrown with violence againſt the ground, and broken in pieces. Before the deſtruction of the temple, the bridegroom and bride were crowns on their heads, but ſince that time this cuſtom has ceaſed. In the ceremonies of marriage, the Hebrews pretend, that they imitate chiefly what was done at Tobias's wedding, which they look upon as a model of a regular and happy marriage. When the company are ſet down to ſupper, the bridegroom ſings a bleſſing in the Hebrew language: after ſupper they perform a dance, which they call the dance of the commandment, and before leading the bride into the marriage-chamber, they rehearſe a bleſſing.

Great part of the nuptial rites of the antient Greeks, conſiſted in offering ſacrifices to different deities, taking of omens, the parties taking one another by the hand, and kiſſing each other in token of fidelity, *&c.* For a further account of their ceremonies on this occaſion, ſee the articles BRIDE and BRIDEGROOM, *&c.*

For an account of the marriage rites of the antient Romans, ſee CONFARREATION, EPITHALAMIUM, *&c.*

Among the antient chriſtians, the eſpouſing parties joined hands together. It was uſual to crown the bridegroom and bride with garlands, nor was it reckoned any harm to have a decent epithalamium.

In the romiſh church, the prieſt is attended at the altar by two clerks, carrying the holy-water pot, the ſprinkler, and a little baſon to put the ring in. After a prayer, and aſking their mutual conſent, and joining their hands, he pronounces the formula, *Ego jungo vos, &c.* at the ſame time making the ſign of the croſs towards them, and ſprinkling them with holy-water; this done, he bleſſes the marriage-ring, and ſprinkling it with holy-water, after which he gives it to the bridegroom, who puts it on the bride's wedding-finger. Before conſummation, the prieſt uſually bleſſes the marriage bed, by ſprinkling it with holy-water.

The nuptial ceremonies of our own church are too well known, and that of the ſeveral nations of the world too numerous to be inſerted here.

NURENBURG, the capital of a terri-

tory of the same name, in the circle of Franconia, in Germany: east long. 11°, north lat. 49° 30′.

NURSERY, in gardening, is a piece of land set apart for raising and propagating all sorts of trees and plants, to supply the garden and other plantations. In a nursery for fruit-trees, the following rules are to be observed: 1. That the soil should not be better than that in which the trees are to be planted out for good. 2. That it ought to be fresh, and not such as has been already worn out by trees, or other large growing plants. 3. It ought neither to be too wet, nor too dry, but rather of a middling nature; though, of the two extremes, dry is to be preferred; because, though trees in such a soil do not make so great a progress, yet they are generally sounder, and more disposed to fruitfulness. 4. It must be inclosed in such a manner that neither cattle nor vermin may come in; and so as particularly to exclude hares and rabbits, which, when the ground is covered with snow, are great destroyers of young trees. 5. The ground being inclosed should be carefully trenched about two feet deep; this should be done in August, that it may be ready for receiving young stocks at the season for planting, which is commonly about the beginning of October: in trenching the ground, you must be careful to cleanse it from the roots of all noxious weeds. 6. The season being come for planting, level down the trenches as equal as possible; and then lay out the ground into quarters, which may be laid out in beds for a seminary, in which you may sow the seeds or stones of fruit. 7. And having provided yourself with stocks, the next year proceed to transplant them, in the following manner: draw a line across the ground intended to be planted, and open a number of trenches exactly straight; then take the stocks out of the seed-beds; in doing which, you should raise the ground with a spade, in order to preserve the roots as intire as possible; prune off the very small fibres, and if there are any that have a tendency to root directly downwards, such roots should be shortened. Then plant them in the trenches, if they are designed for standards, in rows three feet and a half, or four feet, from each other, and a foot and half distant in the rows; but if for dwarfs, three feet, row from row, and one foot in the row will be a sufficient distance. These plants should by no means be headed, or pruned at top, which will weaken them, and cause them to produce lateral branches. If the winter should prove very cold, lay some mulch on the surface of the ground near their roots, taking care not to let it lie too thick near the stems of the plants, and to remove it as soon as the frost is over. In the summer-season destroy the weeds, and dig up the ground every spring between the rows. The second year after planting, such of the stocks as are designed for dwarfs will be fit to bud; but those that are designed for standards should be suffered to grow five or six feet high before they are budded or grafted; for the manner of doing which, see the articles INOCULATION and GRAFTING. As to timber-trees, Mr. Miller advises those gentlemen who would have plantations in parks, woods, *&c.* to make nurseries upon the ground intended for planting, where a sufficient number of the trees may be left standing, after the others have been drawn out to plant in other places.

The ground intended for the flower-nursery should be well situated to the sun; and defended from strong winds by plantations of trees or buildings. The soil also should be light and dry, especially for bulbous-rooted flowers; for in this nursery the off-sets of all bulbous-rooted flowers should be planted, and remain there till they become blowing roots, when they should be removed into the pleasure-garden, and planted either in beds or borders, according to the goodness of the flowers. These flowers may also be raised in the nursery from seed. The seedling auriculas polyanthuses, ranunculuses, anemonies, carnations, *&c.* should be raised in this nursery, where they should be preserved till they have flowered, when all those should be marked that are worthy of being transplanted into the flower-garden; this should be done in their proper seasons: for all these seedling flowers ought not indiscriminately to be exposed to public view in the pleasure-garden, because it always happens, that there are great numbers of ordinary flowers produced among them, which will there make but an indifferent appearance.

NUSANCE, in law, a thing done to the annoyance of another.

Nuſances are either public or private: a public nuſance is an offence againſt the public in general, either by doing what tends to the annoyance of all the king's ſubjects, or by neglecting to do what the common good requires: in which caſe all annoyances and injuries to ſtreets, highways, bridges, and large rivers; as alſo diſorderly ale-houſes, bawdy-houſes, gaming-houſes, ſtages for rope-dancers, *&c.* are held to be common nuſances. A private nuſance is when only one perſon or family is annoyed, by the doing of any thing; as where a perſon ſtops up the light of another's houſe, or builds in ſuch a manner that the rain falls from his houſe upon his neighbour's; as likewiſe the turning or diverting water from running to a man's houſe, mill, meadow, *&c.* ſtopping up a way that leads from houſes to lands; ſuffering a houſe to decay, to the damage of the next houſe; erecting a brew-houſe in any place not convenient; or an houſe of office, *&c.* ſo near another perſon's houſe as to offend him by its ſmell.

Indictment lies for a public or common nuſance at the king's ſuit, whereon the party offending ſhall be fined and impriſoned; but no action can be brought in this caſe except one man ſuffers more by a common nuſance than another; as where a pit is dug in the high-way, and he falls into it. Action on the caſe, or aſſiſe of nuſance, lies, for any private nuſance, at the ſuit of the party aggrieved, and on ſuch actions judgment is given that the nuſance ſhall be removed, and the injured party recover damages: but if a perſon has only a term of years in a houſe or lands, as he has no freehold therein, he can only have an action on the caſe, by which the nuſance will be removed without his recovering damages.

The continuation of a nuſance, is by the law conſidered as a new nuſance, and therefore where a perſon ſuffers a nuſance to be ſet up, and then alienates or lets the land, *&c.* without removing it, an action of the caſe lies againſt him who erected it; and alſo againſt the alienee or leſſee, for continuing it. It has been adjudged that any perſon may remove a nuſance, in which caſe, even the cutting down a gate that croſſes the highway is legal; yet if a man deſtroys the nuſance himſelf, before he commences his action, he cannot have it afterwards, nor recover damages. Neither the lord of a manor, nor the king himſelf, can licence any perſon to make or erect a nuſance.

NUT, *nux*, among botaniſts, denotes a pericarpium of an extraordinary hardneſs, incloſing a kernel or ſeed.

Of theſe there are ſeveral kinds, as filberts, walnuts, *&c.* See the articles FILBERT, WALNUT, *&c.*

The word nut makes part of the engliſh names of ſeveral plants, as the bladder-nut, or ſtaphylæa; the earth-nut; the malabar-nut; the peaſe-nut; the phyſic-nut; the ſpaniſh-nut, *&c.* See the article STAPHYLÆA, *&c.*

NUT-HATCH, *ſitta*, in ornithology. See the article SITTA.

NUTATION, in aſtronomy, a kind of tremulous motion of the axis of the earth, whereby, in each annual revolution, it is twice inclined to the ecliptic, and as often returns to its former poſition. See EARTH and INCLINATION.

Sir Iſaac Newton obſerves, that the moon has the like motion, only very ſmall, and ſcarce ſenſible.

NUTMEG, *nux moſchata*, in natural hiſtory, the kernel of a large fruit, not unlike the peach, the produce of a tree called by botaniſts myriſtica. See the article MYRISTICA.

The nutmeg is ſeparated from its inveſtient coat, the mace, before it is ſent over to us; except that the whole fruit is ſometimes imported in preſerve, by way of ſweetmeat, or as a curioſity. See the article MACE.

The nutmeg, as we receive it, is of a roundiſh or oval figure, of a tolerably compact and firm texture, but eaſily cut with a knife, and falling to pieces on a ſmart blow. Its ſurface is not ſmooth, but furrowed with a number of wrinkles, running in various directions, though principally longitudinally. It is of a greyiſh brown colour on the outſide, and of a beautiful variegated hue within, being marbled with brown and yellow variegations, running in perfect irregularity through its whole ſubſtance. It is very unctuous and fatty to the touch, when powdered, and is of an extremely agreeable ſmell, and of an aromatic taſte, without the heat that attends that kind of flavour in moſt of the other ſpecies.

There are two kinds of nutmeg in the ſhops, the one called by authors the male, and the other the female. The female is the kind in common uſe, and is of the ſhape

ſhape of an olive: the male is long and cylindric, and has leſs of the fine aromatic flavour than the other, ſo that it is much leſs eſteemed, and people who trade largely in nutmegs will ſeldom buy it. Beſides this oblong kind of nutmegs, we ſometimes meet with others of perfectly irregular figures, but mere luſus naturæ, not owing to a different ſpecies of the tree. The longer male nutmeg, as we term it, is called by the Dutch the wild nutmeg. It is always diſtinguiſhable from the others, as well by its want of fragrancy, as by its ſhape: it is very ſubject to be worm-eaten, and is ſtrictly forbid, by the Dutch, to be packed up among the other, becauſe it will give occaſion to their being worm-eaten too, by the inſects getting from it into them, and breeding in all parts of the parcel.

The largeſt, heavieſt, and moſt unctuous of the nutmegs are to be choſen, ſuch as are of the ſhape of an olive, and of the moſt fragrant ſmell. The Dutch import them from the Eaſt-Indies.

Nutmeg is greatly uſed in our foods, and is of excellent virtues as a medicine; it is a good ſtomachic, it promotes digeſtion, and ſtrengthens the ſtomach. It alſo ſtops vomiting; is an excellent remedy in flatuſes; and is happily joined with rhubarb, and other medicines, in diarrhœas. It is obſerved to have a ſoporific virtue, and to exert it too ſtrongly, if taken in immoderate quantities. It has a conſiderable degree of aſtringency; and given after toaſting before the fire, till thoroughly dry and crumbly, it has been ſometimes known alone to cure diarrhœas.

Nutmegs on being imported, pay a duty of 1 s. 6 d. $\frac{38\frac{5}{8}}{100}$d. and draw back, on exportation, 1 s. $4\frac{33\frac{1}{5}}{100}$d.

NUTRITION, in the animal œconomy, is the repairing the continual loſs, which the different parts of the body undergo. The motion of the parts of the body, the friction of theſe parts with each other, and eſpecially the action of the air, would deſtroy the body entirely, if the loſs was not repaired by a proper diet, containing nutritive juices; which being digeſted in the ſtomach, and afterwards converted into chyle, mix with the blood, and are diſtributed through the whole body for its nutrition. See the articles DIET, DIGESTION, CHYLE, &c.

In young perſons, the nutritive juices not only ſerve to repair the parts that are damaged, but alſo to encreaſe them, which is called growth.

In grown perſons, the cuticle is every where conſtantly deſquamating, and again renewing; and in the ſame manner the parts rubbed off, or otherwiſe ſeparated from the fleſhy parts of the body, are ſoon ſupplied with new fleſh; a wound heals, and an emaciated perſon grows plump and fat. See the article CORPULENCY.

Buffon, in order to account for nutrition, ſuppoſes the body of an animal, or vegetable, to be a kind of mould, in which the matter neceſſary to its nutrition is modeled and aſſimilated to the whole. But, continues he, of what nature is this matter, which an animal, or vegetable, aſſimilates to its own ſubſtance? What power is it that communicates to this matter the activity and motion neceſſary to penetrate this mould? and, if ſuch a force exiſt, would it not be by a ſimilar force that the internal mould itſelf might be reproduced?

As to the firſt queſtion, he ſhews, that there exiſts in nature an infinite number of living organical parts, and that all organized bodies conſiſt of ſuch organical parts; that their production coſts nature nothing, ſince their exiſtence is conſtant and invariable; ſo that the matter which the animal, or vegetable, aſſimilates to its ſubſtance, is an organical matter, of the ſame nature with that of the animal, or vegetable, which conſequently may augment its volume, without changing its form, or altering the quality of the ſubſtance in the mould.

As to the ſecond queſtion: there exiſt, ſays he, in nature, certain powers, as that of gravity, that have no affinity with the external qualities of the body, but act upon the moſt intimate parts, and penetrate them throughout, and which can never fall under the obſervation of our ſenſes.

And, as to the third queſtion, he anſwers, that the internal mould itſelf is reproduced, not only by a ſimilar power, but it is plain that it is the very ſame power that cauſes the unfolding and reproduction thereof: for it is ſufficient, proceeds he, that, in an organized body that unfolds itſelf, there be ſome part ſimilar to the whole, in order that this

part

part may one day become itſelf an organized body, altogether like that of which it is actually a part.

Defect of NUTRITION, or ATROPHY, in medicine. See ATROPHY.

NUTRITION, in pharmacy, a kind of preparation, conſiſting in the gradual mixture of liquors of different natures, by ſtirring them together till they have acquired a thick conſiſtence, as in making butter of ſaturn, *&c.*

NUTTUNO, or NETTUNO. See the article NETTUNO.

NUX, the WALNUT-TREE, in botany. See the article JUGLANS.

NUX CUPRESSI, CYPRESS-NUT, a fruit improperly ſo called, as not at all of the nut-kind, is accounted a very powerful aſtringent and balſamic, ſcarce any ſimple medicine being preferable to it in diarrhœas and dyſenteries. It is alſo ſaid to be a very good febrifuge.

NUX MOSCHATA. See NUTMEG.

NUX PISTACHIA. See PISTACHIA.

NUX VOMICA. See NUX VOMICA.

NUYS, a town of Germany, twenty miles north of Cologn.

NYBURG, a town of Denmark, ſituated at the eaſt-end of the iſland of Funen, ten miles eaſt of Odenſee: eaſt long. 10°, north lat. 55° 30′.

NYCHTHEMERON, νυχθημερον, the natural day, or day and night, which together always make twenty-four hours. See the articles DAY and NIGHT.

NYCTALOPIA, in medicine, a two-fold diſorder of the eye, one of which is oppoſite to the other. In the firſt, the ſight is beſt in the night, and in obſcure places; whereas, in a clear light, their ſight fails, ſo that they can hardly ſee any thing. In the other ſort of nyctalopia, the patient can ſee nothing at all except in a clear and bright light.

As theſe infirmities ariſe from a natural bad formation of the eye; they are therefore incurable.

NYCTANTHES, *Arabian* JASMINE, in botany, a genus of the diandria-monogynia claſs of plants, the flower of which conſiſts of a ſingle ſaucer-like petal, with the limb divided into eight oblong ſegments: the fruit is a didymous, bilocular berry, with a large roundiſh ſeed in each cell.

NYCTICORAX, a bird of the heron-kind, called in engliſh the night-raven; by reaſon it flies chiefly in the night-time, and makes a very diſagreeable croaking.

NYLAND, a province of Finland, ſituated on the gulph of Finland, weſt of the province of Carelia.

NYMPH, in mythology, an appellation given to certain inferior goddeſſes inhabiting the mountains, woods, waters, *&c.* ſaid to be the daughters of Oceanus and Tethys. All the univerſe was repreſented as full of theſe nymphs, which are diſtinguiſhed into ſeveral ranks or claſſes. The general diviſion of them is into celeſtial and terreſtrial; the former of which were called Uraniæ, and were ſuppoſed to be intelligences that governed the heavenly bodies or ſpheres. The terreſtrial nymphs called Epigeiæ, preſided over the ſeveral parts of the inferior world, and were divided into thoſe of the water, and thoſe of the earth. The nymphs of the water were the oceanitides, or nymphs of the ocean; the nereids, the nymphs of the ſea; the naiads and ephydriades, the nymphs of the fountains: and the limniades, or nymphs of the lakes. The nymphs of the earth were the oreades, or nymphs of the mountains; the napææ, nymphs of the meadows; and the dryads and hamadryads, who were nymphs of the foreſts and woods. Beſides theſe, we meet with nymphs who took their names from particular counties, rivers, *&c.* as the cithæroniades, ſo called from mount Cithæron in Bœotia; the dodonides, from Dodona; the tiberiades, from the Tiber, *&c.*

Goats were ſometimes ſacrificed to the nymphs; but their conſtant offerings were milk, oil, honey and wine.

NYMPH, among naturaliſts, that ſtate of winged-inſects between their living in the form of a worm, and their appearing in the winged or moſt perfect ſtate.

The eggs of inſects are firſt hatched into a kind of worms, or maggots; which afterwards paſs into the nymph-ſtate, ſurrounded with ſhells or caſes of their own ſkins: ſo that, in reality, theſe nymphs are only the embryo-inſects, wrapped up in this covering; from whence they at laſt get looſe, though not without great difficulty.

During the nymph-ſtate, the creature loſes its motion. Swammerdam calls it nympha aurelia, or ſimply aurelia; and others give it the name of chryſalis, a term of the like import. See the article CHRYSALIS.

NYMPHÆ, in anatomy, two membranaceous parts, ſituated on each ſide the rima.

rima. They are of a red colour and cavernous ſtructure, ſomewhat reſembling the wattles under a cock's throat. They are ſometimes ſmaller, ſometimes larger, and are continuous to the præputium of the clitoris, and joined to the interior ſide of the labia.

The nymphæ are full of nervous papillæ, whence their quick ſenſe: they have alſo ſmall glands, that ſecrete a fatty matter. Their uſe ſeems to be to increaſe the pleaſure in coition, and to direct the courſe of the urine.

The nymphæ are ſometimes ſo large, as not only to hang without the labia pudendi; but alſo to prove very troubleſome to the woman in walking, ſitting, and in conjugal embraces, ſo as to require the ſurgeon's aſſiſtance.

When this is the caſe the patient being laid in a proper poſture, the ſurgeon ſhould take hold of the nymphæ with his left-hand, and with a pair of ſciſſars in his right-hand, cut off ſo much of them as is judged neceſſary; taking care to have ſtyptics in readineſs to ſtop the hæmorrhage, and cordial medicines to prevent the patient from fainting. The wound is to be dreſſed with ſome vulnerary balſam, and healed in the common method. See the article WOUND.

This operation is rarely found neceſſary in our parts of the world, but is frequently practiſed in the eaſt; being properly the circumciſion of women. See the article CIRCUMCISION.

NYMPHÆA, the WATER LILY, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of a number of petals, uſually fifteen: they are ſmaller than the cup, and are inſerted into the ſide of the germen in more than a ſingle ſeries: the fruit is an oval fleſhy berry, containing a great many roundiſh ſeeds.

The root of this plant was recommended by the antients, as an aſtringent for internal uſe, and as a ſtyptic to ſtop the bleeding of wounds, or other hæmorrhages. At preſent, it is not much known in the ſhops; but the common people uſe it internally for the fluor albus in women, and for gleets and ſeminal weakneſſes in men.

NYMPHEUM, in antiquity, a public hall, magnificently decorated, for entertainment, &c. and where thoſe, who wanted convenience at home, held their marriage-feaſts; whence the name.

NYMPHOMANIA, in medicine, the ſame with furor uterinus. See FUROR.

NYMPHOTOMIA, in ſurgery, the operation of cutting the nymphæ, when too large. See the article NYMPHÆ.

NYONS, a town of Dauphine, in France: eaſt long. 5° 6′, north lat. 44° 28′.

NYSLOT, a town of Sweden, in the province of Finland, ſixty miles north of Wyburg: eaſt long. 29°, north lat. 62°.

NYSSA, in botany, a genus of the dioecia decandria claſs of plants, the flower of which is divided into five ſegments: the ſtyle is ſingle; and the fruit is a drupe, containing only one cell, with a ſingle nut. It is a native of Virginia.

O.

O, or O, the fourteenth letter, and fourth vowel of our alphabet, pronounced as in the words *noſe*, *roſe*, &c.

The ſound of this letter is often ſo ſoft, as to require it double, and that chiefly in the middle of words; as *gooſe*, *reproof*, &c. and in ſome words this *oo* is pronounced like *u* ſhort, as in *flood*, *blood*, &c.

As a numeral, O is ſometimes uſed for eleven; and with a daſh over it, thus Ō, for eleven thouſand.

In the notes of the antients, O. CON. is read *opus conductum*; O. C. Q. *opera conſilioque*; O. D. M. *operæ*, *donum*, *munus*; and O. LO. *opus locatum*.

In muſic, the O, or rather a circle, or double CO, is a note of time, called by us a ſemi-breve; and, by the Italians, circolo. The O is alſo uſed as a mark of triple time, as being the moſt perfect

perfect of all figures. See TRIPLE.

OAK, *quercus*, in botany, a genus of the monoecia-polyandria class of plants, without any flower-petals; the stamina are from five to ten in number: the cup of the female flower is formed of a single, coriaceous leaf, undivided at the edge, and rough: the styles are from two to five: the seed is single, large and oval. For the galls of the oak. See GALLS.

Oak-timber is one of the principal materials in building; and being strong in all positions, may be trusted in cross and transverse-work, as for summers, beams, &c.

OAK *of Jerusalem*, in botany, a name given to chenopodium. See the article CHENOPODIUM.

Poison OAK. See TOXICODENDRUM.

OAKAM, old ropes untwisted, and pulled out into loose hemp, in order to be used in caulking the seams, tree-nails and bends of a ship, for stopping or preventing leaks.

OAKHAMPTON, a borough of Devonshire, twenty miles west of Exeter, which sends two members to parliament.

OAR, in navigation, a long piece of wood, made round where it is to be held in the hand, and thin and broad at the other end, for the easier cutting and resisting the water, and consequently moving the vessel, by rowing. Oars for ships are generally cut out of fir-timber, those for barges are made out of New-England, or Dantzick-rafters, and those for boats, either out of english-ash, or fir-rafters from Norway.

OAT, *avena*, in botany, a genus of the triandria-digynia class of plants, the corolla of which consists of two valves; the nectaria are two; from the back of the corolla, there grows a single, crooked, and contorted arista, or awn: the corolla serves as a pericarpium, surrounding a single seed, which is of an oblong figure, very sharp-pointed at each end, and with a longitudinal furrow.

Some physicians have recommended a diet-drink made of oats, in various distempers. The method of preparing it is as follows: Take of fresh oats entire, and well washed, one pound and a half; of the fresh root of succory, cut into slices, one handful; of spring-water, twelve pints; boil all together in an earthen vessel, till half is consumed; then strain the liquor through a linen cloth, and add to it six ounces of coarse sugar, and half an ounce of sal prunellæ; let it boil again, then set it by for a day and a night in a cool place; lastly, pour off the clear liquor, and keep it in a cellar in vessels close stopped.

Two ordinary cups of this liquor given twice a day, three hours before, and as many after dinner, are said to do wonders in the cure of all kinds of fevers, colic-pains, pleurisies, the itch, cutaneous tumours, and hypochondrical disorders; as also in cleansing the kidneys from sand, and opening the obstructed viscera. The use of it is to be continued thirteen days.

OATH, *jusjurandum*, is a solemn affirmation in which the persons sworn invoke the almighty to witness that their testimony is true, renouncing all claim to his mercy, and calling for his vengeance if it be false: on which account such an oath is termed sacramentum, a holy band, or tie; and it is also called a corporal oath, because the person who takes it, lays his right-hand on the book of the Evangelists. All oaths must be administered by a person duly authorized, and in order to discover truth and right; and therefore, if a person not duly authorized, administers an oath, he is punishable both with fine and imprisonment. A person who is to be a witness in a cause may have two oaths administered to him; the one to speak the truth, in relation to what the court shall think fit to ask him, concerning himself or any thing else that is not evidence in the cause; and the other purely to give evidence in the cause wherein he is produced as a witness; the former of which is called an oath upon a voyer dire. By statute, all that bear offices of any kind under the government, members of the house of commons, ecclesiastical persons, members of colleges, school-masters, serjeants at law, counsellors, attornies, sollicitors, advocates, proctors, &c. are required to take the oaths of allegiance, supremacy, and abjuration; all persons neglecting, or refusing to take these oaths are declared to be incapable of executing their offices and employments, of suing at law, of being guardians, executors, &c. and are liable to the forfeiture of 500 l. 13 W. III. c. 6. 1 Ann. c. 22. and 1 Geo. I. c. 13.

OBDACH, a town of Germany, in the circle of Austria and dutchy of Stiria, thirty-five miles west of Gratz.

OBADIAH, or *the prophecy of* OBADIAH, a canonical book of the Old Testament, which is contained in one single chapter;

and is partly an invective againſt the cruelty of the Edomites, who mocked and derided the children of Iſrael, as they paſſed into captivity, and with other enemies, their confederates, invaded and oppreſſed thoſe ſtrangers, and divided the ſpoil amongſt themſelves: and partly a prediction of the deliverance of Iſrael, and of the victory and triumph of the whole church over her enemies.

OBEDIENCE, or OBEDIENTIA, in the canon-law, is ſometimes uſed for an office, or the adminiſtration of it. In our antient cuſtoms obedientia was uſed, in the general, for every thing that was enjoined the monks by the abbots: and in a more limited ſenſe it was applied to the farm belonging to the abbey, to which the monks were ſent vi ejuſdem obedientiæ, either to look after the farm, or collect the rents. Hence, theſe rents themſelves were alſo called obedientiæ.

OBELISK, in architecture, a truncated, quadrangular, and ſlender pyramid, raiſed as an ornament, and frequently charged either with inſcriptions or hieroglyphics.

Obeliſks appear to be of very great antiquity, and to be firſt raiſed to tranſmit to poſterity precepts of philoſophy, which were cut in hieroglyphical characters: afterwards they were uſed to immortalize the great actions of heroes, and the memory of perſons beloved. The firſt obeliſk mentioned in hiſtory was that of Rameſes king of Egypt, in the time of the Trojan war, which was forty cubits high. Phius, another king of Egypt, raiſed one of forty-five cubits; and Ptolemy Philadelphus, another of eighty-eight cubits, in memory of Arſinoe. Auguſtus erected one at Rome in the Campus Martius, which ſerved to mark the hours on an horizontal dial, drawn on the pavement. They were called by the Egyptian prieſts the fingers of the ſun, becauſe they were made in Egypt alſo, to ſerve as ſtyles, or gnomons to mark the hours on the ground. The Arabs ſtill call them Pharaoh's needles, whence the Italians call them agugliа, and the French aiguilles.

The proportions in the height and thickneſs are nearly the ſame in all obeliſks; their height being nine, or nine and a half, and ſometimes ten times their thickneſs; and their diameter at the top never leſs than half, and never greater than three fourths of that at the bottom.

OBELISK, †, in grammar, a mark in form of a dagger, uſed to refer the reader to a note in the margin, at the ſide or bottom of a page.

OBERNSBERG, a town of Germany, in the circle of Bavaria, fifteen miles ſouth of Paſſau.

OBERSTEIN, the capital of the county of the ſame name, in the Palatinate of the Rhine, thirty miles eaſt of Triers.

OBERWESEL, or WESEL, a town of Germany, in the electorate of Triers, thirty-ſeven miles north-eaſt of the city of Triers.

OBJECT, in philoſophy, ſomething apprehended, or preſented to the mind, by ſenſation or by imagination.

Chauvinus defines an object to be that about which a power, act, or habit is employed: thus, good is the object of the will, truth of the underſtanding; and, in like manner, colour is the object of ſight, ſound of hearing, &c.

Objects are uſually divided into next, *proxima*, which are thoſe the power or habit is immediately employed on; in which ſenſe, colour is the next object of ſight: and remote, which are thoſe only perceived by means of the former; in which ſenſe the wall is the remote object of ſight, ſince we only ſee it by means of its colour, &c. Ideas are the immediate objects of the mind, in thinking; bodies, their relations, attributes, &c. are the mediate objects. Hence it appears, that there is a ſort of ſubordination of objects. But let it be obſerved that a next object with regard to a remote one, is properly a ſubject, not an object. See the article SUBJECT.

The ſchools alſo diſtinguiſh objects *per ſe*, being properly ſuch as move or affect our ſenſes; ſuch are the ſenſible qualities: and objects *per accidens*, which are ſubſtances, and only affect us by being inveſted with ſenſible qualities. Again, they diſtinguiſh between common objects, ſuch as affect divers ſenſes, as motion, figure, &c. and proper objects, which affect only one ſenſe.

Object is alſo uſed for the matter of an art or ſcience, or that about which it is employed; in which ſenſe, it alſo coincides with ſubject.

The ſchools diſtinguiſh divers kinds of objects in the ſame ſcience, as material object, formal object, objectum quod complexum, objectum quod incomplexum, &c.

OBJECT GLASS *of a teleſcope, or microſcope*, the

the glaſs placed at the end of the tube which is next the object. See the articles TELESCOPE and MICROSCOPE.

OBJECTION, ſomething urged to overthrow a poſition, or a difficulty raiſed againſt an allegation, or propoſition of a perſon we are diſputing withal.

OBJECTIVE is uſed, in the ſchools, in ſpeaking of a thing which exiſts no otherwiſe, than as an object known. The exiſtence of ſuch a thing is ſaid to be objective.

This word is alſo uſed for the power, or faculty, by which any thing becomes intelligible; and for the act itſelf, whereby any thing is preſented to the mind and known.

OBIT, among chriſtians, a funeral ſolemnity, or office for the dead, moſt commonly performed when the corpſe lies in the church uninterred.

It likewiſe ſignifies the anniverſary office, or annual commemoration of the dead, performed yearly on the day of their death, with prayers, alms, &c. In religious houſes they have a regiſter, in which they enter the obits of their founders, or benefactors, which is thence termed the obituary.

OBLATI, in church-hiſtory, were ſecular perſons, who devoted themſelves and their eſtates to ſome monaſtery, into which they were admitted as a kind of lay-brothers. The form of their admiſſion, was, putting the bell-ropes of the church round their necks, as a mark of ſervitude. They wore a religious habit, but different from that of the monks.

Oblati, in France, were a kind of lay-monks, antiently placed by the king in all the abbeys and priories belonging to the crown; to whom the religious were obliged to give a monk's allowance, on account of their ringing the bells, ſweeping the church, &c. Theſe places were uſually filled with lame ſoldiers, ſome of whom had penſions without performing any duty. But theſe oblati with their penſions, have ſince been removed to the hôtel of the invalids at Paris.

OBLATION, a ſacrifice, or offering made to God. See the article SACRIFICE.

In the canon-law, oblations are defined to be any thing offered by godly chriſtians to God and the church, whether moveables or immoveables. There were antiently ſeveral kinds of thoſe, as oblationes altaris, which were given to the prieſt for ſaying maſs: oblationes defunctorum, given by the laſt will of the deceaſed, to the church: oblationes mortuorum, thoſe given by the relations of the dead at their burials; oblationes pœnitentium, thoſe given by penitents; and oblationes pentecoſtales, or whitſuntide-offerings. Till the fourth century, the church had no fixed revenues, the clergy wholly ſubſiſting on voluntary oblations. Oblations are now in the nature of tythes, and recoverable in the eccleſiaſtical courts.

OBLIGATION, in general, denotes any act whereby a perſon becomes bound to another, to do ſomething; as to pay a ſum of money, be ſurety, or the like.

Obligations are of three kinds, *viz.* natural, civil, and mixed. Natural obligations are entirely founded on natural equity; civil obligation, on civil authority alone, without any foundation in natural equity; and mixed obligations are thoſe which being founded on natural equity, are further enforced by civil authority.

In a legal ſenſe, obligation ſignifies a bond, wherein is contained a penalty, with a condition annexed for the payment of money, &c. The difference between it and a bill is, that the latter is generally without a penalty or condition, though it may be made obligatory: and obligations are ſometimes by matter of record, as ſtatutes and recognizances. See the article BOND.

OBLIQUATION, or *Cathetus of* OBLIQUATION. See CATHETUS.

OBLIQUE, in geometry, ſomething aſlant, or that deviates from the perpendicular. Thus an oblique angle, is either an acute or obtuſe one, *i. e.* any angle except a right one. See the article ANGLE.

OBLIQUE ASCENSION, in aſtronomy. See the article ASCENSION.

OBLIQUE CASES, in grammar, are all the caſes except the nominative. See CASE.

OBLIQUE DESCENSION, in aſtronomy. See the article DESCENSION.

OBLIQUE LINE, that which, falling on another line, makes oblique angles with it, *viz.* one acute, and the other obtuſe.

OBLIQUE PERCUSSION, in mechanics. See the article PERCUSSION.

OBLIQUE PLANES, in dialling, are thoſe which recline from the zenith, or incline towards the horizon. See the articles DIAL and PLANE.

The obliquity, or quantity of this inclination, or reclination, may be found by means of a quadrant.

OBLIQUE

OBLIQUE SAILING, in navigation, is when a ſhip ſails upon ſome rhumb between the four cardinal points, making an oblique angle with the meridian; in which caſe, ſhe continually changes both latitude and longitude.

Oblique ſailing is of three kinds, *viz.* plain-ſailing, mercator's ſailing, and great circle-ſailing. See the article NAVIGATION.

OBLIQUE SPHERE, is where the pole is elevated any number of degrees leſs than 90°; in which caſe, the axis of the world, the equator, and parallels of declination will cut the horizon obliquely. See the article SPHERE.

OBLIQUITY *of the ecliptic.* See the article ECLIPTIC.

OBLIQUUS, in anatomy, oblique, a name given to ſeveral muſcles, particularly in the head, eyes, and abdomen. For the oblique muſcles of the head, ſee the article FRONTAL MUSCLES.

The oblique muſcles of the eye, called alſo rotatores, are two, a larger and a ſmaller. The firſt, which is alſo called obliquus ſuperior, and trochlearis, the greater, upper, or trochlear oblique muſcle of the eye, has its origin near the recti, and paſſes through a ſingular trochlea, of an almoſt cartilaginous ſtructure, near the large canthus of the eye: from thence it again turns back, and is inſerted into the upper part of the eye, near its middle: hence it obliquely depreſſes the pupil, and in ſome degree draws it outwards. The obliquus minor, the leſſer oblique muſcle of the eye, ariſes from the anterior and inner part of the orbit, not far from the naſal canal: it ſurrounds obliquely the lower part of the bulb, and is inſerted into its exterior part, near the middle. Hence it moves the pupil of the eye obliquely upwards; but both theſe muſcles acting together, draw it forwards, and thus they are the antagoniſts of the recti, which draw it backwards.

The oblique muſcle of the ear, called alſo by ſome the ſemi-circularis, is one of the three muſcles of the malleus, and is ſituated in the external and boney part of the ductus Euſtachii; from whence paſſing a little upwards, and backwards through the canal, it is inſerted into the largeſt proceſs of the malleus, and ſerves to relax and ſtraiten, in various degrees, the membrane of the tympanum.

The oblique aſcendents are, a pair of muſcles of the abdomen, that ariſe from the fifth rib to the eleventh, and terminate, by their aponeuroſes, in the ſpine of the ileum, the os pubis, and the linea alba; however, ſeveral fibres paſs thro' them. The oblique aſcendants, are a pair of muſcles that ariſe from the oſſa ilei, the os ſacrum, and the ſpines of the loins; and are inſerted partly in the lower ſide of the ſpurious ribs, and partly in the linea alba. There is an annulus or ring in the lower part of the oblique deſcendents; and a perforation in the oblique aſcendents, ſerving for giving paſſage to proceſſes of the peritonæum, and the ſpermatic veſſels in men, and to the ligamentum rotunda of the uterus in women.

OBLONG, in general, denotes a figure that is longer than broad: ſuch is a parallelogram, ellipſis, &c. See the article PARALLELOGRAM and ELLIPSIS.

OBLONGATA MEDULLA, in anatomy. See MEDULLA and BRAIN.

OBOLUS, in antiquity, an antient athenian coin. See the article COIN.

Among antient phyſicians, obolus likewiſe denoted a weight, equal to ten grains. See the article WEIGHT.

OBREPTITIOUS, an appellation given to letters patent, or other inſtruments, obtained of a ſuperior by ſurprize: or, by concealing from him the truth.

OBSCURA CAMERA. See CAMERA.

OBSCURE, ſomething that is dark and reflects little light, or that is not clear and intelligible.

Obſcurity, in this laſt ſenſe, ariſes from hence, that we do not conceive and expreſs things as they are, but as we judge them to be, ere we have fully examined them. See the articles KNOWLEDGE, LANGUAGE, WORD, &c.

OBSCURO, or CLARO OBSCURO. See the article CLARO-OBSCURO.

OBSECRATION, in rhetoric, a figure whereby the orator implores the aſſiſtance of God, or man. Such is that of Palinurus, Æn. vi. v. 363, ſeq.

Quod te per coeli jucundum lumen & auras,
Per genitorem oro, per ſpem ſurgentis Iuli;
Eripe me his, invicte, malis: &c.

OBSEQUIES, the ſame with funeral ſolemnities. See the articles BURIAL, FUNERAL, &c.

OBSERVANCE, in a monaſtic ſenſe, denotes a community of religious, tied to the perpetual obſervation of the ſame rule.

OBSERVATION, among navigators, ſignifies the taking the ſun's, or the ſtar's meridian

meridian altitude, in order thereby to find the latitude. See LATITUDE.

Coeleſtial OBSERVATIONS. See COELESTIAL, and the following article.

OBSERVATORY, a place deſtined for obſerving the heavenly bodies; being, generally, a building erected on ſome eminence, covered with a terrace for making aſtronomical obſervations.

The more celebrated obſervatories are,

1. The Greenwich-obſervatory, built in 1676, by order of Charles II. at the ſollicitations of Sir Jonas Moor, and Sir Chriſtopher Wren; and furniſhed with the moſt accurate inſtruments, particularly a noble ſextant of ſeven feet radius, with teleſcopic ſights.

The perſon to whom the province of obſerving was firſt committed, was Mr. J. Flamſteed; a man, who, as Dr. Halley expreſſes it, ſeemed born for the employment. For the ſpace of fourteen years, with unwearied pains, he watched the motion of the planets; chiefly thoſe of the moon, as it was given him in charge, that a new theory of that planet, exhibiting all irregularities, being found, the longitude might thence be determined.

In the year 1690, having provided himſelf with a mural arch, of ſeven feet diameter, well fixed in the plane of the meridian, he began to verify his catalogue of fixed ſtars, which hitherto had depended altogether on the diſtances meaſured with the ſextant, after a new and very different manner; *viz.* by taking the meridional altitudes, and the moments of culmination, or the right aſcenſion and declination. This inſtrument he was ſo pleaſed with, that he laid the uſe of the ſextant almoſt wholly aſide. Thus was the aſtronomer royal employed for thirty years; in the courſe of which time, nothing had appeared in public, worth ſo much expence and preparation; ſo that the obſerver ſeemed rather to have been employed for his own ſake, and that of a few friends, than for the public: though it was notorious the obſervations that had been made, were very numerous, and the papers ſwelled to a great bulk.

This occaſioned prince George of Denmark, in the year 1704, to appoint certain members of the royal ſociety, *viz.* the honourable Francis Robarts, Sir Chriſtopher Wren, Sir Iſaac Newton, Dr. Gregory, and Dr. Arbuthnot, to inſpect Flamſteed's papers, and chooſe out of them ſuch as they ſhould think fit for the preſs; purpoſing to print them at his own expence: but, the patron of the work dying, before the impreſſion was half finiſhed, it lay ſtill for ſome time; till at length it was reſumed by order of queen Anne, and the care of the preſs committed to Dr. Arbuthnot, and that of correcting and ſupplying the copy, to Dr. Halley: ſuch was the riſe and progreſs of the Hiſtoria Cœleſtis; the principal part whereof is the catalogue of the fixed ſtars, called alſo the Greenwich-Catalogue. The Greenwich-Obſervatory is found, by very accurate obſervations, to lie in 51° 28′ 30″. north latitude.

2. The pariſh-Obſervatory, built by the late Louis XIV, in the Fauxbourg St. Jaques.

It is a very ſingular, but withal a very magnificent building; the deſign of monſieur Perault: it is eighty feet high, and at top is a terras.

The difference in longitude between this and the Greenwich-Obſervatory is 2° 20′ weſt.

In it is a cave, or cellar, 170 feet deſcent, for experiments that are to be made far from the ſun, *&c.* particularly ſuch as relate to congelations, refrigerations, indurations, conſervations, *&c.*

3. Tycho Brahe's Obſervatory which was in the little iſland Ween, or Scarlet-Iſland, between the coaſts of Schonen and Zeland, in the Baltic.

It was erected and furniſhed with inſtruments at his own expence, and called by him Uraniburg.

Here he ſpent twenty years in obſerving the ſtars: the reſult is his catalogue.

Mr. Gordon, in the Philoſophical Tranſactions, obſerves, that this was none of the fitteſt places for ſome kind of obſervations, particularly the riſings and ſettings; as lying too low, and being land-locked on all the points of the compaſs but three; and the land-horizon exceedingly rugged and uneven.

4. Pekin-Obſervatory; father Le Compte deſcribes a very magnificent Obſervatory, erected and furniſhed by the late emperor of China, in his capital, at the interceſſion of ſome jeſuits, miſſionaries, chiefly father Verbieſt, whom he made his chief obſerver.

The inſtruments are exceedingly large; but the diviſions leſs accurate, and the contrivance in ſome reſpect, leſs commodious than thoſe of the Europeans: The

The chief are an armillary, zodiacal ſphere, of ſix Paris-feet diameter; an equinoctial ſphere, of ſix feet diameter; an azimuthal horizon, ſix feet diameter; a large quadrant, ſix feet radius; a ſextant, eight feet radius; and a celeſtial globe, ſix feet diameter.

OBSESSION, the being beſet by an evil ſpirit, which without entering the body, torments, and, as it were, beſieges the perſon from without; in which ſenſe, it differs from poſſeſſion.

The marks of obſeſſion, according to ſome, are a being hoiſted into the air, and thrown violently down without being hurt; ſpeaking languages never learnt, having an averſion to all acts and offices of religion, *&c.* Some phyſicians look on all caſes of obſeſſion as natural, and curable by natural medicines, particularly purgatives and vomitives.

OBSIDIANUS *Lapis*, the OBSIDIAN-STONE. See the article LAPIS.

OBSIDIONALIS, an epithet applied by the Romans to a ſort of crown. See the article CROWN.

OBSTRUCTION, in medicine, ſuch an obturation of the veſſels, as prevents the circulation of the fluids, whether of the ſound and vital, or of the morbid and peccant kind, through them; ariſing from an exceſs of the bulk of the fluid to be tranſmitted, above the capacity of the veſſel which ought to tranſmit it.

Such an obſtruction, then, proceeds either from the narrowneſs of the veſſels, or the exceſſive bulk of the fluids to be tranſmitted through them, or a concurrence of both theſe circumſtances. The narrowneſs of the veſſels is produced either by external compreſſion, the proper contraction of the veſſels themſelves, or an increaſed thickneſs in their membranes. The bulk of the molecules of the blood is increaſed by the viſcidity of the fluids, or by means of an error loci.

An obſtruction may alſo proceed from a narrowneſs of the veſſels in conjunction with a preternatural bulk of the molecules of the fluids.

The veſſels may be externally compreſſed. 1. By an adjacent tumour, either of the plethoric, inflamed, purulent, ſchirrhous, cancerous, œdematous, encyſted, ſteatomatous, atheromatous, meliceróus, hydatidic, aneuriſmatic, varicoſe, tophous, pituitous, calculous, or callous kind. 2. By fractures, luxations, diſtortions, or diſtractions of the harder parts of the body, compreſſing the flexible and plient veſſels. 3. By every cauſe which preternaturally ſtretches and lengthens the veſſels, whether by a tumour, or the preſſure of a part when out of its natural ſituation, or by any external ſtretching force. 4. By external compreſſing cauſes, ſuch as too tight cloths, bandages, the weight of an incumbent body preſſing upon one particular part, and ligatures. This effect may alſo be produced by motion, attrition, and embracing other bodies, for when any part of the human body, is moved againſt an hard obſtacle, the flexible veſſels are neceſſarily compreſſed. An increaſed contraction, eſpecially of the ſpiral fibres, and alſo of the longitudinal, leſſens the cavities of the veſſels; and this contraction ariſes firſt from every cauſe which increaſes the elaſtic force of the fibres, veſſels, and viſcera; ſecondly, from the tumour and preternatural diſtention of thoſe minute veſſels, by a contexture of which the ſides of the larger veſſels are formed; and thirdly, by a diminution of that cauſe which dilates the veſſels whether for inſtance inanition or a languid ſtate of the veſſels. See TUMOUR, *&c.*

The thickneſs of the membranes of the veſſels is increaſed firſt by every tumour happening in thoſe veſſels, by the union and contexture of which the membranes are formed; and ſecondly, by calluſes, either of a cartilaginous, membranous, or bony nature, formed there.

The effects of an obſtruction are various, according to the diverſity of the obſtructed veſſel, and obſtructing matter. In the ſanguiferous arterial veſſels, an inflammation of the firſt kind happens; in the dilated lymphatic arterial veſſels, an inflammation of the ſecond kind; in the larger lymphatic veſſels, an œdema; in the ſmaller, pains without any apparent tumour; but in the pinguiferous, oſſeous, medullary, and biliary veſſels, other diſorders ariſe from an obſtruction. See the article INFLAMMATION, *&c.*

When the different kinds of obſtructions are diſtinctly known, it is no difficult matter to find a cure adapted to each. For that ſpecies of obſtruction which ariſes from external compreſſion indicates the removal of the compreſſing cauſe, if poſſible. That ſpecies of obſtruction which ariſes from an increaſed contraction of the fibres may be removed, firſt, by ſuch medicines as correct the too great contraction of the fibres, veſſels, and viſcera; ſecondly, and more eſpecially,

cially, if their virtues have immediate access to the part affected, which advantage is principally to be obtained by fomentations, fumigations, baths, and ointments; thirdly, by such remedies as empty the too full vessels composing the membranes. This intention is answered by evacuants, in general, but especially by laxative, diluting, resolvent, attenuating, detersive, and evacuant medicines applied to the vessels themselves; and fourthly, by such medicines as resolve callosities when formed. See the article FOMENTATION, &c.

The unfitness of the fluids for passing through the vessels, which depends upon their losing their spherical figure, may be known from an investigation of its causes, which are for the most part subjected to the senses. It is cured by such remedies as restore the spherical figure of the globules of the blood. Of this kind are all those things which increase the motion of the fluids through the vessels and viscera; such as all stimulating and corroborating medicines, as also brisk motion.

As the concretion and inspissation of the fluids arise from different causes, so it requires different methods of treatment, and different medicines according to the various conditions of the patient. And this diversity of causes, when investigated, will discover the most proper medicines, and the best method of using them. In general, the concretion of humours is removed first by the reciprocal motion of the vessels; secondly, by dilution; thirdly, by an attenuating fluid conveyed to the mass of blood mixed with it, and circulating along with it; and fourthly, by removing the coagulating cause.

The reciprocal motion of the vessels is procured first by such remedies as diminish the distending causes, such as venesection; secondly, by such medicines as corroborate the vessels; thirdly, by friction and muscular motion. See the article FRICTION.

The cause which coagulates the fluids, is removed by the influence of strongly attracting remedies, but when the fluids propelled into improper places become incapable of circulating, and by that means generate obstructions, many and violent disorders are produced: for which reason the source and cause from which they proceed ought to be carefully attended to. The cure is obtained, first by repelling the impacted matter with a retrograde motion into larger vessels; secondly, by resolving it; thirdly, by relaxing the vessels; and fourthly, by suppuration. See SUPPURATION, &c. The impacted motion is repelled with a retrograde motion, first by evacuating the fluid which acts upon the impacted matter by a liberal and sudden venesection, by which means the obstructing matter is forced back by the effort of the contracted vessel; and secondly, by friction performed from the extremities of the bases of the vessels. See the article EVACUANTS, &c.

OBSTRUCTION *of the bowels*, OBSTRUCTIO ALVI, in medicine. See the article COSTIVENESS.

OBSTRUENTS. See DEOBSTRUENTS.

OBTURATOR, in anatomy, a name for the two muscles of the thigh, one of which is the marsupialis, and is called obturator internus, and the other the obturator externus. These two muscles shut up the foramen or aperture between the os pubis and the hip-bone. The obturator internus comes from the internal circumference of the hole that is between the ischium and the os pubis; and passing thro' the sinuosity of the ischium, it is inserted into the dent of the great trochanter. Its tendon lies between the gemini: it turns the thigh to the outside. The obturator externus comes from the external circumference of the same hole as the former; it embraces the neck of the thigh-bone, and passes under the quadratus to the small cavity of the great trochanter.

OBTUSE, signifies blunt, dull, &c. in opposition to acute, sharp, &c. thus we say obtuse angle, obtuse angled triangle, &c. See the article ANGLE, &c.

OBVENTIONS, in antient law-books, signify the produce of a benefice, or spiritual living, including oblations, tithes, rents, and other revenues. See the article OBLATION, &c.

OBULARIA, in botany, a genus of the didynamia angiospermia class of plants, the corolla whereof is monopetalous, the tube is campanulated, ventricose and pervious, the limb is divided into four patulous segments. The fruit is a roundish compressed ventricose capsule; formed of two valves, and containing several seeds, in form of a fine powder.

OBY, a great river of Russia, which rises in Kalmuck Tartary, and forms the boundary between Europe and Asia, till it falls into the frozen ocean, after it has run

run a courfe of above two thoufand miles.

OCCASIO, in antient law-writers, denotes a tribute which the lord impofed on his vaffals or tenants, on occafion of war, or other exigencies.

OCCATION, a term in the antient hufbandry, by which they expreffed what we do by harrowing, though they performed it with a different inftrument; being a kind of rake, with the teeth of which they levelled the ground, and broke the clods; and with the hand ftrewed the corn over this level ground. Then they brought on the plough and ploughed it in, fo that the grain was fown in furrows, as we exprefs it, and ufually came up as we fee it does at this time with us in the fame cafe in the lower parts only. After it had got a few leaves they went over the ground again with the fame inftrument to clear away the weeds, and move the earth about the roots of the young plants.

OCCIDENT, in geography, the weftward quarter of the horizon, or that part of the horizon where the ecliptic, or the fun therein, defcends into the lower hemifphere, in contradiftinction to orient. Hence we ufe the word occidental, for any thing belonging to the weft, as occidental bezoard, occidental pearl, *&c.*

OCCIPITAL, in anatomy, a term applied to the parts of the occiput, or back part of the fkull. See the articles Occipitis Os, and Skull.

OCCIPITALES, or the Occipital muscles, arife on each fide from the os occipitis, where it adheres to the temporal bones: they afcend upwards over the offa bregmatis, and join their aponeurofes with the frontal ones, to which they feem to afford their fixed point: they, together with the frontal ones, cover the head as it were with a helmet, or cap, and they affift their actions. Morgagni has obferved, that thefe occipital mufcles are fometimes intirely wanting, and at others, when not abfolutely deficient, that they are fo thin that it is fcarce poffible to fee them: fometimes alfo they are larger than ufual, and are divided as it were each into two. It has been from an examination of them in fome fubject, in which they were of this kind, that Sanctorius makes two occipital mufcles of each fide.

OCCIPITIS os, the occipital bone, in anatomy, the fourth bone of the cranium, fo called from its fituation in the occiput, or back part of the fkull. See the article Skull.

Its figure refembles a lozenge, irregularly notched, or indented; being convex on the outfide, and concave within. It is very thick, and has a protuberance about the middle of its convex fide: it has alfo three apophyfes, two of which are condyloide, ferving for its articulation with the upper vertebra of the neck, whereby the whole head is fupported.

OCCULT, fomething fecret, hidden, or invifible. The occult fciences, are magic, necromancy, cabbala, *&c.*

Occult, in geometry, is ufed for a line that is fcarce perceivable, drawn with the point of the compaffes, or a leaden pencil. Thefe lines are ufed in feveral operations, as the raifing of plans, defigns of building, pieces of perfpective, *&c.* They are to be effaced when the work is finifhed.

OCCULTATION, in aftronomy, the time a ftar or planet is hid from our fight, by the interpofition of the body of the moon, or of fome other planet. See the article Eclipse.

Circle of perpetual Occultation, is a parallel in an oblique fphere, as far diftant from the depreffed pole, as the elevated pole is from the horizon. See the article Horizon.

All the ftars between this parallel and the depreffed pole, never rife, but lie conftantly hid under the horizon of the place.

OCCUPANT, in law, the perfon that firft feizes, or gets poffeffion of a thing; and this by law muft be of what has a natural exiftence, as of land, *&c.* A perfon cannot be an occupant of a void poffeffion. Where the tenant, for the term of another's life, dies, the *celui qui vie* being alive, or in cafe a tenant for his own life, grants over his eftate to another, and the grantee dies before him, there fhall be an occupant, unlefs the grant be made alfo to the grantee's heirs during the term, *&c.* By ftatute it is ordained, that an eftate, *pur autre vie*, may be devifed by will; and if no devife thereof is made, whereby the heir becomes fpecial occupant, it fhall be affets in his hands to pay debts, *&c.* or for want of fuch heir, it is to go to the executors or adminiftrators of the perfon who had the eftate.

OCCUPATION, in a legal fenfe, is taken for ufe or tenor, as in deeds it is frequently

quently ſaid, that ſuch lands are or lately were in the tenure or occupation of ſuch a perſon. This is likewiſe uſed for a trade or myſtery.

Occupation, or Occupancy, in the civil law, denotes the poſſeſſion of ſuch things as at preſent properly belong to no private perſon; but are capable of being made ſo, as by ſeizing or taking of ſpoils in war, by catching things wild by nature, as birds and beaſts of game, *&c.* or by finding things before undiſcovered, or loſt by their proper owners.

OCCUPAVIT, in law, a writ which iſſues for a perſon that is ejected out of an eſtate of inheritance in time of war.

OCCUPIERS of walling, a term in the ſalt-works for the perſons who are the ſworn officers that allot, in particular places, what quantity of ſalt is to be made, that the markets may not be overſtocked, and ſee that all is carried fairly and equally between the lord and the tenant.

OCEAN, in geography, that vaſt collection of ſalt and navigable waters, in which the two continents, the firſt including Europe, Aſia, and Africa, and the laſt America, are incloſed like iſlands.

The ocean is diſtinguiſhed into three grand diviſions. 1. The Atlantic ocean, which divides Europe and Africa from America, which is generally about three thouſand miles wide. 2. The pacific ocean, or South-ſea, which divides America from Aſia, and is generally about ten thouſand miles over: and, 3. The Indian ocean, which ſeparates the Eaſt-Indies from Africa, which is three thouſand miles over. The other ſeas, which are called oceans, are only parts or branches of theſe, and uſually receive their names from the countries they border upon.

For the ſaltneſs, tides, *&c.* of the ocean, ſee the articles Sea, Tides, *&c.*

OCHLOCRACY, οχλοκρατεια, that form of government wherein the populace has the chief adminiſtration of affairs.

OCHNA, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five roundiſh petals, and its fruit is a very large, truncated, and fleſhy receptacle, containing on each ſide a ſingle berry, with a ſingle oval ſeed.

OCHRE, *ochra*, in natural hiſtory, a genus of earths, ſlightly coherent, and compoſed of fine, ſmooth, ſoft, argillaceous particles, rough to the touch, and readily diffuſible in water.

Ochres are of various colours, as red, yellow, blue, brown, green, *&c.* Of the red there are eleven ſpecies, of the yellow as many, of blue one, of brown two, of green one, and of black two. All which have, at one time or other, been uſed in painting.

The earths of this kind, uſed in medicine, are only three. 1. A yellow kind, deſcribed by Dioſcorides under the name of ochra attica, and eſteemed a very valuable external medicine in inflammations and tumours, applied in form of a cataplaſm. 2. The deep red kind, called rubrica ſinopica, and ſaid to be an excellent aſtringent, and conſequently good in diarrhœas, dyſenteries, and hæmorrhages of all kinds. 3. The ſpecies of ochre, called lapis armenus. See Lapis.

OCHRIDA, or Lochrida, a town of european Turky, in the province of Albania, 110 miles weſt of Salonichi: eaſt long. 21°, north lat. 41°.

OCHSENFURT, a town of Franconia, in Germany, twelve miles ſouth-eaſt of Wurtſburg.

OCIMUM, or Ocymum, basil, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, with a bilabiated cup: its flower is monopetalous and ringent; and its ſeeds, which are four in number, are contained in the cup, which cloſes for that purpoſe.

Both the herb and ſeeds of baſil are uſed in medicine, and are ſaid to be good in diſorders of the lungs, and to promote the menſes.

OCKA, a great river of Muſcovy, which joins the river Moſco at Kolomna.

OCKER, or Ocka, a river of Germany, which, riſing in the ſouthern part of the dutchy of Brunſwic, runs north, and paſſing by Wolfembuttle and Brunſwic, falls into the river Aller.

OCKINGHAM, a market-town of Berkſhire, ſeven miles eaſt of Reading.

OCTAETERIDES, in chronology, denotes a cycle of eight years, at the end of which three entire lunar months were added.

This cycle was in uſe at Athens, till Meton diſcovered the golden number. See the article Golden Number.

OCTAGON, or Octogon, in geometry, is a figure of eight ſides and angles: and this, when all the ſides and angles are equal, is called a regular octagon, or

or one which may be inſcribed in a circle. If the radius of a circle circumſcribing a regular octagon be $=r$, and the ſide of the octagon $=y$; then $y=\sqrt{2r^2-r\sqrt{2r^2}}$.

OCTAGON, in fortification, denotes a place that has eight baſtions. See the article FORTIFICATION.

OCTAHEDRON, or OCTAEDRON, in geometry, one of the five regular bodies, conſiſting of eight equal and equilateral triangles. See the article SOLID.

The ſquare of the ſide of the octahedron is to the ſquare of the diameter of the circumſcribing ſphere, as 1 to 2.

If the diameter of the ſphere be 2, the ſolidity of the octahedron inſcribed in it will be 1,33333, nearly.

The octahedron is two pyramids put together at their baſes, therefore its ſolidity may be found by multiplying the quadrangular baſe of either of them, by one third of the perpendicular height of one of them, and then doubling the product.

OCTANDRIA, in botany, one of the claſſes of plants eſtabliſhed by Linnæus, the eighth in order; the characters of which are, that all the plants comprehended in it have hermaphrodite flowers, and eight ſtamina or male parts in each. See the article BOTANY.

It is ſub divided into orders, which are denominated from the number of piſtils contained in each flower: thus the octandria-monogynia contain eight ſtamina, and only one piſtil; the octandria-digynia, eight ſtamina, and two piſtils; and ſo on, trigynia, tetragynia, &c. denoting three, four, &c. piſtils.

OCTANT, or OCTILE, in aſtronomy, that aſpect of two planets, wherein they are diſtant an eighth part of a circle, or 45° from each other. See ASPECT.

OCTAPLA, in matters of ſacred literature, denotes a polyglot bible, conſiſting of eight columns, and as many different verſions of the ſacred text, *viz.* the original Hebrew both in hebrew and greek characters, greek verſions, &c.

OCTATEUCH, an appellation given to the eight firſt books of the Old Teſtament. See the article CANON.

OCTAVE, in muſic, an harmonical interval, conſiſting of ſeven degrees, or leſſer intervals. See the article INTERVAL.

The moſt ſimple perception that we can have of two ſounds, is that of uniſons; in regard, the vibrations there begin and end together. The next to this is the octave, where the more acute ſound makes preciſely two vibrations, while the grave or deeper one makes one; and wherein, by conſequence, the vibrations of the two meet at every vibration of the more grave one. Hence uniſon and octave paſs almoſt for the ſame concord: hence alſo the proportion of the two ſounds that form the octave are in numbers or in lines, as 1 : 2; ſo that two chords or ſtrings of the ſame matter, thickneſs, and tenſion, one whereof is double the length of the other, produce the octave.

The octave is called among the antient authors the diapaſon, becauſe containing all the ſimple tones and chords; all of which derive their ſweetneſs from it, as they riſe more or leſs directly out of it. To be juſt, it muſt contain diatonically ſeven degrees or intervals, and conſequently eight terms or ſounds; whence it is called by the name of octave.

The octave containing in itſelf all the other ſimple concords, the degrees being the difference of thoſe concords; it is evident, the diviſion of the octave comprehends the diviſion of all the reſt. By joining therefore all the ſimple concords to a common fundamental, we have the following ſeries:

1	$\frac{5}{6}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{5}{8}$	$\frac{3}{5}$	$\frac{1}{2}$
Fun.	3dl.	3d gr.	4th.	5th.	6 leſs.	6 gr.	8ve.

Again, the ſyſtem of the octave, containing all the original concords, and the compound concords being the ſum of the octave, and ſome leſſer concord; in order to have a ſeries to reach beyond an octave, we muſt continue them in the ſame order through a ſecond octave, as in the firſt, and ſo on to a third and fourth octave. Such a ſeries is called the ſcale of muſic. See the article SCALE.

The compoſition of octaves may be carried on infinitely, yet three or four is the greateſt length we go in ordinary practice. The old ſcales went but to two, or at moſt to three octaves, which is the full compaſs of an ordinary voice. When we ſay that the antient ſcales went but to two, or at furtheſt to three octaves, we do not mean that they were not allowed to exceed that compaſs; but that between the extremes of a double, or triple octave, were contained all the variety that was poſſible or needful; for even then, an active muſician would take the liberty to ſurprize them, by running through greater extremes.

Notwithſtanding the perfection of the octave, yet after the third, the agreement dimi-

diminishes very fast; nor do they ever go so far at one movement as from one extreme to the other of a double or triple octave; seldom beyond a single one; nor is either voice or instrument well able to go beyond. To form a fourth octave, if the acuter string be half a foot long, which is but a small length to render a clear sound, the graver must be eight feet. If then we would go beyond a fourth octave, either the acute string would be too short, or the grave one too long; not but this inconvenience is remedied by a greater tension of each.

The octave is not only the greatest interval of the seven original concords, but the first in perfection; as it is the greatest interval, all the lesser concords are contained in it: indeed, the manner wherein the lesser are found in an octave, is somewhat extraordinary, *viz.* by taking both an harmonical and arithmetical mean between the extremes of the octave, and then both an arithmetical and harmonical mean between each extreme, and the most distant of the two means last found, *i. e.* between the less extreme and the first arithmetical, and between the greatest extreme and the first harmonical mean, you will have all the lesser concords.

Nicomachus, disciple of Pythagoras, says, that to produce an octave, take two chords and stretch the one by a weight of six pounds, and the other by one of twelve; the sound of the last will be an octave to that stretched by the six pound weight; and from thence proceeds to fix the proportion of weights to be used for the production of the other intervals.

Mr. Malcolm observes, that any wind-instrument being over-blown, the sound will rise to an octave, and no other concord, which he ascribes to the perfection of the octave, and its being next to unison. From the simple and perfect form of the octave arises this peculiar property, that it may be doubled and tripled, and still be concord; that is, the sum of two or more octaves are concord; though the more compound become gradually less agreeable; he adds, that there is such an agreement between its extremes, that whatever sound is concord to one, is so to the other.

Des Cartes, from an observation of the same kind from an organ-pipe, concludes, that no sound is heard, but its acute octave seems some way or other to eccho in the ear.

The antient grecian system had no greater compass than a double octave, or fifteenth, which they called dis diapason. In thorough bass, the octave and its replies are marked by a simple (8). In melody, the voice or sound of an instrument may move an octave *per salto*, but very seldom two octaves, especially the voice. In harmony, two octaves should never follow one another, if differing in degree of tune *per salto* of a fifth or other interval; but it may be followed by any of the other concords, perfect or imperfect. See the article CONCORD.

OCTAVE, in law, signifies the eighth day inclusive after any feast.

OCTILE, or OCTANT. See OCTANT.

OCTOBER, in chronology, the tenth month of the julian year, consisting of thirty-one days: it obtained the name of October from its being the eighth month in the calendar of Romulus. See the articles MONTH and YEAR.

OCTOGON, or OCTAGON. See the article OCTAGON.

OCTOSTYLE, in the antient architecture, is the face of an edifice adorned with eight columns.

The eight columns of the octostyle may either be disposed in a right line, as in the Pantheon, and the pseudodiptere temple of Vitruvius; or in a circle, as in the round monothere temple of Apollo Pythius at Delphi, &c.

OCULUS, the eye, in anatomy. See the article EYE.

OCULUS BELI, in natural history, one of the semi-pellucid gems, of a greyish-white colour, variegated with yellow, and with a black central nucleus: it is of a roundish form, and its variegations very beautifully represent the pupil and iris of the eye: whence the name.

OCULUS CATI. See the article ASTERIA.

OCULUS LEPORINUS, in surgery, the same with ectropium. See ECTROPIUM.

OCULUS MUNDI, one of the semi-pellucid gems, of a whitish-grey colour, without any variegations.

OCYMUM, or OCIMUM, in botany. See the article OCIMUM.

OCZAKOW, a port town of european Turky, the capital of Budziac Tartary: east long. 35°, north lat. 46°.

ODA, in the turkish seraglio, signifies a class, order, or chamber. The grand seignior's pages are divided into five classes or chambers. The first, which is the lowest in dignity, is called the great oda, from the great number of persons that

compoſe it: theſe are the juniors, who are taught to read, write, and ſpeak the languages. The ſecond is called the little oda, where from the age of fourteen or fifteen years, till about twenty, they are trained up to arms, and the ſtudy of all the polite learning the Turks are acquainted with. The third chamber, called kilar-oda, conſiſts of two hundred pages, which, beſides their other exerciſes, are under the command of the kilardgi-bachi, and ſerve in the pantry and fruitery. The fourth conſiſts only of twenty-four, who are under the command of the khazineda-bachi, and have charge of the treaſure in the grand ſignior's apartment, which they never enter with cloaths that have pockets. The fifth is called kas-oda, or privy-chamber, and is compoſed of only forty pages, who attend in the prince's chamber. Every night eight of theſe pages keep guard in the grand ſeignior's bed-chamber, while he ſleeps: they take care that the light, which is conſtantly kept in the room, does not glare in his eyes, leſt it ſhould awake him; and if they find him diſturbed with troubleſome dreams, they cauſe him to be awaked by one of their agas.

ODA-BACHI, or ODDOBASSI, among the Turks, an officer equivalent to a ſerjeant or corporal among us. The common ſoldiers and janizaries, called oldachis, after having ſerved a certain term of years, are always preferred, and made biquelars; and from being biquelars, they in time become odabachis; that is, corporals of companies, whoſe numbers are not fixed; being ſometimes ten, and ſometimes twenty.

Their pay is ſix doubles per month, and they are diſtinguiſhed by a large felt a foot broad, with two large oſtrich-feathers.

ODE, in poetry, a ſong, or a compoſition proper to be ſung.

Among the antients, odes ſignified no more than ſongs; but with us they are very different things. The antient odes were generally compoſed in honour of their gods, as many of thoſe of Pindar and Horace.

Theſe had originally but one ſtanza, or ſtrophe, but afterwards they were divided into three parts, the ſtrophe, the antiſtrophe, and the epode. The prieſts going round the altar ſinging the praiſes of the gods, called the firſt entrance, when they turned to the left, the ſtrophe; the ſecond, turning to the right, they called antiſtrophe, or returning; and, laſtly, ſtanding before the altar, they ſung the remainder, which they called the epode. See the articles ANTISTROPHE, STROPHE, *&c.*

Heroes and triumphs were alſo ſubjects for the ode; and in courſe of time love and entertainments were likewiſe thought very ſuitable to it. Here Anacreon and Sapho excelled, and Horace has left us ſome of both ſorts wrote with peculiar ſweetneſs and elegance. Among the moderns, Dryden's ode on St. Cecilia's day, and Pope's on the ſame ſubject, are juſtly allowed to exceed every thing of the kind, either in this, or in any of the modern languages.

The diſtinguiſhing character of an ode is ſweetneſs; the poet is to ſoothe the minds of his readers by the variety of his verſe, and the delicacy of words; the beauty of numbers, and the livelineſs of expreſſions: for variety of numbers is eſſential to the ode. At firſt, indeed, the verſe of the ode was but of one kind, but for the ſake of pleaſure, and to adapt it to muſic, the poets ſo varied the numbers and feet, that their kinds are now almoſt innumerable. One of the moſt conſiderable is the Pindaric, diſtinguiſhed by its boldneſs, and the rapidity of its flights.

An ode may either be ſublime or of the lower ſtrain, jocoſe or ſerious, mournful or exulting, even ſometimes ſatirical, but never epigrammatical; and, in ſhort, it may conſiſt of wit, but not of that turn which is the peculiar characteriſtic of an epigram.

ODENSEE, the capital of Funen, one of the largeſt of the daniſh iſlands in the Baltic, ſituated ſeventy-two miles weſt of Copenhagen.

ODER, a river which riſes in the carpathian mountains, on the confines of Hungary, runs through Sileſia and Brandenburgh, and then ſeparating the eaſtern from the weſtern Pomerania, divides itſelf into ſeveral channels, and falls into the Baltic ſea.

ODER is alſo a town of Sileſia, ſituated on the river of the ſame name: eaſt long. 17° 17′, north lat. 49° 45′.

ODERBERG, a town in the dutchy of Sileſia, in Bohemia, ſituated on the river Oder: eaſt long. 17° 45′, north lat. 50° 6′.

ODERNHEIM, a town of Germany, in the palatinate of the Rhine, fifteen miles fouth of Mentz.

ODEUM, in grecian antiquity, a mufic-theatre, built by Pericles, the infide of which was filled with feats and ranges of pillars, and on the outfide the roof defcended fhelving downwards from a point in the center, with many bendings, in imitation of the king of Perfia's pavillion. Here the mufical prizes were contended for, and here alfo, according to Ariftophanes, was a tribunal.

ODIHAM, a market-town of Hampfhire, twenty miles north-eaft of Winchefter.

ODIO ET ATIA, a writ antiently directed to the fheriff, to enquire whether a perfon committed to prifon on fufpicion of murder, was juftly committed, or whether it was done through malice; and if this laft appeared to be the cafe, there iffued another writ to the fheriff to bail him.

ODONTALGIA, the TOOTH-ACH, in medicine. See the article TOOTH-ACH.

ODONTOIDE, in anatomy, an appellation given to a procefs of the fecond vertebra of the neck, from its refemblance to a tooth. See VERTEBRÆ.

ODOR, or ODOUR. See SMELL.

ODOROUS, or ODORIFEROUS, appellations given to whatever fmells ftrongly, whether they be fetid or agreeable; but chiefly to things whofe fmell is brifk, and agreeable.

ODYSSEE, οδυσσεια, a celebrated epic poem of Homer, wherein are related the adventures of Ulyffes, in his return from the fiege of Troy. See the articles EPIC and ILIAD.

The moral of the odyffee is, that a perfon's abfence from home, fo that he cannot have an eye to his affairs, occafions great diforders; and, accordingly, the hero's abfence is the principal and moft effential action of the whole poem. This poem, adds Boffu, is better calculated for the people than the iliad, where the fubjects fuffer rather from the bad conduct of their princes, than by their own fault: whereas the meaneft people are as liable to ruin their eftates and families by negligence, as the greateft princes; and, confequently, have as much need of Homer's lectures, and are as capable of profiting by them, as kings themfelves.

OECONOMICS, the art of managing the affairs of a family, or community; and hence the perfon who takes care of the revenues and other affairs of churches, monafteries, and the like, is termed oeconomus.

OECONOMY, οικονομια, denotes the prudent conduct, or difcreet and frugal management, whether of a man's own eftate, or that of another.

Animal OECONOMY, comprehends the various operations of nature, in the generation, nutrition, and prefervation of animals. See the articles GENERATION, NUTRITION, *&c.*

The doctrine of the animal oeconomy is nearly connected with phyfiology, which explains the feveral parts of the human body, their ftructure, ufe, *&c.*

OECUMENICAL, fignifies the fame with general, or univerfal; as oecumenical council, bifhop, *&c.* See the articles COUNCIL and BISHOP.

OEDEMA, or PHLEGMATC TUMOUR, in medicine and furgery, a fort of tumour attended with palenefs and cold, yielding little refiftance, retaining the print of the finger when preffed with it, and accompanied with little or no pain. See the article TUMOUR.

This tumour obtains no certain fituation in any particular part of the body, fince the head, eye-lids, hands, fometimes part, fometimes the whole body, is afflicted with it. When the laft mentioned is the cafe, the patient is faid to be troubled with a cachexy, leucophlegmatia, or dropfy. See the article CACHEXY, *&c.*

But if any part of the body is more fubject to this diforder than another, it is certainly the feet, which are at that time called fwelled or oedematous feet. We fhall treat diftinctly of them in this place, that it may appear what is the true nature and rational method of phlegmatic tumours in whatever part of the body they fhall be found.

The proximate caufe of an oedema, fays Heifter, is doubtlefs to be found in the too great ferofity or vifcidity of the blood, which ftagnates in the very minuteft veficles of the fat, or tunica cellulofa, and by this means ftretches out the fkin, with which it is immediately covered. This vitiated ftate of the blood chiefly arifes in men who are either of a cold and phlegmatic habit of body, or are advanced in years. It chiefly falls upon them in cold weather, or in the winter, when the inclemency of the feafon heightens the diforder of nature. Another caufe of this diforder is an irregularity in diet, by over-eating or drinking, and by the conftant ufe of crude, cold, and hard meats.

Inter-

Intermitting fevers or agues conduce very much to this disorder, especially if the patient indulges himself in an intemperate use of cooling liquors, while the fit is upon him, and his thirst urgent: the disease frequently owes its rise to too plentiful a discharge of blood from a wound, the nose, or any other way; and sometimes to obstructions of the menstrual discharge in women, or to a compression of the vena cava by the weight of the foetus in women far gone with child; or by any scirrhous body in the abdomen, which greatly hinders the return of the blood from the lower limbs; or to too sedentary a way of life; or too great an indulgence in lying in bed; or, lastly, to a phthisis and difficulty of breathing; or to any disorder or fatigue of body, which disturbs or destroys the natural force of the heart in maintaining the circulation with due vigour.

From what has been said it plainly appears by what signs an oedema manifests itself: therefore this observation alone remains to be added, that the harder the tumour is, and the longer the pitting which is made by the finger remains visible, the stagnating fluid is in such proportion thicker, and more tenacious.

The method of treating oedematous tumours is very different, according to the different causes to which they owe their rise: therefore we are first to make diligent search after the genuine cause of the disorder, before we attempt its cure. The external method of treating these tumours in the legs and feet, is usually to have recourse to frequent frictions with warm cloths, to be repeated evening and morning till the part grows red and hot; then the limbs are to be diligently preserved from the injuries of the cold air, by wearing stockings made of some warm fur, and at night keeping hot bricks about the legs and feet. After this there is a proper bandage to be applied, which is to ascend gradually from the feet up to the knees. The first step towards a cure by internal medicines, according to Junker, must be the correcting the mucous and viscid state of the humours by the neutral salts, as tartarum vitriolatum, and the like; and by gum ammoniacum, the roots of pimpernel, and woods of sassafras, guaiacum, and the like; with the warm aromatics, as ginger and the spices, and carminative seeds; the matter when thus attenuated is to be evacuated by purges of a strength proportioned to the constitution of the patient. After the use of these internal and the external medicines just before mentioned, Heister thinks it proper to use strengthening remedies externally; for which end, the limb is to be placed over burning rectified spirits of wine, wrapping it up in cloths, in such a manner as it may receive the steam. This will incline the stagnating fluids to escape through the skin, or render them fit to return into the circulation, and at the same time restore the natural tone of the limb. See the article OBSTRUCTION.

OEDENBURG, or EDENBURG, a town of Hungary, thirty miles south of Vienna.

OELAND, a swedish island in the Baltic sea, between the continent of Gothland, and the isle of Gothland: east long. 16°, north lat. between 56° and 57° 30′.

OELFELD, a town in the dutchy of Magdeburg and circle of Lower Saxony, in Germany, twenty miles east of Brunswic.

OENANTHE, WATER-DROPWORT, in botany, a genus of the pentandria-digynia class of plants, with a radiated flower; the lesser hermaphrodite ones of the disc being composed of five inflexo-cordated petals: the fruit is composed of two oblong seeds, convex and striated on one side, and plane on the other.

A species of this plant, called the hemlock-dropwort, with all the leaves multifid and obtuse, is a terrible poison.

OENANTHE, in ornithology, a species of motacilla, with a grey back and white forehead, frequent in many parts of England, and much esteemed at table: it is otherwise called vitiflora, the fallow-finch, and wheat-ear; being about the bigness of the sparrow. See the article MOTACILLA.

OENAS, a name used by some authors for the wood-pigeon, or bluish columba, with a blackish spot on the wing. See the article COLUMBA.

OENELÆUM, in pharmacy, a mixture of wine and oil, usually of thick black wine and oil of roses; said to be good for anointing wounds, to prevent an inflammation. See WINE and OIL.

OENOPTÆ, in grecian antiquity, a kind of censors at Athens, who regulated entertainments, and took care that none drank too much or too little.

OENOTHERA, the PRIMROSE of VIRGINIA, in botany, a genus of the octandria-monogynia class of plants, the flower

of which confifts of four obverfely cordated petals: the fruit is a cylindrical capfule, with four low angles, being formed of four valves, and containing four cells, with numerous angulated feeds.

OESEL, an ifland at the entrance of the bay of Livonia, in the Baltic fea; fituated in 22° of eaft longitude, and 58° of north latitude.

OESOPHAGUS, in anatomy, the gula, or gullet, is a membranaceous canal, reaching from the fauces to the ftomach, and conveying into it the food taken in at the mouth. Its figure is fomewhat like that of a funnel, and its upper part is called by anatomifts the pharynx. Its fituation is almoft exactly behind the afpera arteria, and longitudinally with the vertebræ of the neck and back; but when it enters the cavity of the thorax, it turns a little to the right, on account of the aorta. Its fubftance is compofed of five coats, of which the firft is membranaceous, and is continuous with the pleura in the thorax. The fecond is robuft and mufcular; and, in the human body, is compofed of a double ftratum of fibres: thofe of one feries longitudinal, and thofe of the other circular. The third coat is cellular, much like that of the inteftines. The fourth is nervous, and divifible into a number of other lamellæ, and furnifhed with a multitude of glands and veffels: hence it is divided by Verheyen into two, under the names of a vafculous and glandulous coat: this is continuous with the interior membrane of the mouth and ftomach. The fifth is villofe, and is called crufta villofa: this is always covered with a mucous liquor.

The mufcles of the pharynx ferve to open and fhut the oefophagus. See the article PHARYNX.

The arteries of the oefophagus are from the carotids, the aorta, the intercoftals, and the cœliac. The veins are from the jugulars, the azygos, and the coronary vein of the ftomach; and the nerves from the par vagum. There are alfo certain excretory ducts, called ductus excretorii novæ Vercelloni, which arife from the glands, and convey a faltifh liquor into the œfophagus and ftomach. The glands, from which thefe have their origin, are of three kinds: 1. The gaftric glands, which are conglomerate, and are fituated near the left orifice of the ftomach. 2. The dorfal ones, which are fituated near the fifth vertebra of the thorax. And, 3. The bronchial, tracheal, and thyroide. The ufe of the œfophagus is for deglutition, and a commixtion of the liquid ferving for digeftion.

OESTRUM VENERIS, in anatomy, a name by which fome call the clitoris. See the article CLITORIS.

OESTRUS, in zoology, a genus of two-winged flies, the mouth of which is a fimple fiffure, without either teeth or probofcis.

To this genus belong the breeze or gad-fly, the grey trumpet-fly, *&c.* diftinguifhed by the different variegations of their colours.

OETING, the capital of the county of the fame name, in the circle of Swabia, in Germany: eaft long. 10° 35′, and north lat. 49°.

OFFENBURG, a free imperial city of the circle of Swabia, in Germany, fituated on the river Kintzig: eaft long. 7° 40′, and north lat. 48° 30′.

OFFENCE, *delictum*, in law, an act committed againft the law, or omitted where the law requires it.

Offences are diftinguifhed into two kinds, *viz.* fuch as are capital, and fuch as are not. Capital offences are thofe for which the offender is to lofe his life. Thofe not capital, where the offender may forfeit his lands, and goods; be fined, or fuffer corporal punifhment, or both, but not lofe his life. Under capital offences are comprehended high-treafon, petit-treafon, and felony: and offences not capital include the remaining part of the pleas of the crown, and come under the title of mifdemeanours. Some offences are punifhable by the common law, but moft of them by ftatutes.

OFFICE, a particular charge or truft, or a dignity attended with a public function. The word is primarily ufed in fpeaking of the offices of judicature and policy; as the office of a fecretary of ftate, the office of a fheriff, of a juftice of peace, *&c.* See SECRETARY, *&c.*

Every fubject is, in general, efteemed capable of an office, except a minor; but if an office, for the execution of juftice, be granted to a perfon who has not the previous knowledge neceffary for his executing it, the grant thereof is void: and no perfon, though he be ever fo well qualified, can have a judicial office in reverfion. The king cannot grant any office to the prejudice of another's freehold in his office, for this is contrary to law; and there-

therefore the judges have refufed to admit an officer, though commanded by the king's fign manual. Antient offices muft be granted in the antient manner; nor can a new office be erected, or an old one be entitled to new fees, without an act of parliament. It is enacted, that no officer, or minifter of the king, fhall obtain his place or office on account of any gift, favour, or affection; and if the officers of juftice, or thofe belonging to the treafury, &c. fhall fell any of the offices in their gift, or take any money, profit, or reward for them, they fhall forfeit their eftates therein; and the perfon fo buying is rendered incapable of enjoying fuch office: but this does not extend to the two chief juftices, or to the judges of the affize, who may grant offices as before the act, 5 & 6 Edw. VI. c. 16. It is obferved, that feveral offices were never intended for the ufe of one perfon; but offices of truft are to be perfonally executed, and cannot be affigned to others. A public office by non-ufer becomes forfeited: but it is not fo in the cafe of a private office, unlefs fome fpecial damage be received.

OFFICE alfo fignifies a place or apartment appointed for officers to attend in, in order to difcharge their refpective duties and employments: as the fecretary's office, office of ordnance, excife-office, fignet-office, paper-office, pipe-office, fix-clerks-office, &c. for the refpective duties of each, fee the articles SECRETARY, ORDNANCE, EXCISE, &c.

OFFICE, in architecture, denotes all the apartments appointed for the neceffary occafions of a palace or great houfe, as kitchens, pantries, confectionaries, &c.

OFFICE, in the canon-law, is ufed for a benefice that has no jurifdiction annexed to it.

It is alfo ufed for divine fervice, celebrated in public: and in the romifh church it is applied to a particular prayer preferred in honour of fome faint: thus, when any faint is canonized, a particular office is at the fame time affigned him, out of the common office of the confeffors, the virgin, or the like. We fay the office of the Holy Spirit, of the Virgin, of the paffion, of the holy facrament, of the dead, &c.

OFFICE FOUND, in common law, is ufed for an inquifition made to the king's ufe, of any thing found, by virtue of his office who makes inquifition: hence, to traverfe an office, is to traverfe an inquifition taken of office, before an efcheator; and to return an office, is to return that which was found by virtue of the office.

By the common law, the king is not in poffeffion of lands that are forfeited for treafon, during the offender's life, without an office-found thereon; but the land, whereof a perfon attainted of high treafon dies feized in fee, is actually vefted in the king, though there be no office; for the blood being corrupted, the land cannot go by defcent.

OFFICER, a perfon poffeffed of a poft or office. See the preceding article.

The great officers of the crown, or ftate, are the lord high fteward, the lord high chancellor, the lord high treafurer, the lord prefident of the council, the lord privy-feal, the lord chamberlain, the lord high conftable, the earl marfhal; each of which fee under its proper article.

Commiffion-OFFICERS, are thofe appointed by the king's commiffion: fuch are all from the general to the cornet inclufive, who are thus denominated in contradiftinction to warrant-officers, who are appointed by the colonel's or captain's warrant, as quarter-mafters, ferjeants, corporals, and even chaplains and furgeons.

Field OFFICERS are fuch as command a whole regiment, as the colonel, lieutenant-colonel, and major.

Flag-OFFICERS. See FLAG-OFFICERS, and ADMIRAL.

General-OFFICERS are thofe whofe command is not limited to a fingle company, troop, or regiment; but extends to a body of forces, compofed of feveral regiments: fuch are the general, lieutenant-general, major-generals, and brigadiers.

OFFICERS *of the houfhold.* See the article HOUSHOLD.

OFFICERS *of juftice*, are thofe entrufted with the adminiftration of juftice.

OFFICERS *of the mint.* See MINT.

Municipal OFFICERS. See MUNICIPAL.

OFFICERS *of police*, are thofe in whom the government and direction of the affairs of a community are invefted, as mayors, aldermen, fheriffs, &c.

Reformed OFFICERS. See REFORMADO.

Royal OFFICERS are thofe who adminifter juftice in the king's name, as the judges, &c. See the article JUDGE.

Sea-OFFICERS, or OFFICERS *of the marine*, are thofe who command fhips of war. See the article NAVY.

Staff-OFFICERS are fuch as, in the king's prefence, bear a white ftaff, or wand; and

and at other times, on their going abroad, have it carried before them by a footman bare-headed: such are the lord steward, lord chamberlain, lord treasurer, &c. The white staff is taken for a commission, and at the king's death each of these officers breaks his staff over the hearse made for the king's body, and by this means lays down his commission, and discharges all his inferior officers.

Subaltern-OFFICERS are all who administer justice in the name of subjects; as those who act under the earl marshal, admiral, &c. In the army, the subaltern officers are the lieutenants, cornets, ensigns, serjeants, and corporals.

OFFICIAL, in the canon-law, an ecclesiastical judge, appointed by a bishop, chapter, abbot, &c. with charge of the spiritual jurisdiction of the diocese. Of these there are two kinds; the one is as it were, the vicar-general of the diocese, and is called by the canonists officialis principalis, and in our statute law, the bishop's chancellor. There is no appeal from his court to the bishop, his being esteemed the bishop's court. See BISHOP'S COURT. The other, called officialis foraneus, is appointed by the bishop, when the diocese is very large: he has but a limited jurisdiction, and has a certain extent of territory assigned him, wherein he resides. See the article COMMISSARY.

OFFICIAL is also a deputy appointed by an archdeacon, as his assistant, who sits as judge in the archdeacon's court.

OFFICINAL, in pharmacy, an appellation given to such medicines, whether simple or compound, as are required to be constantly kept in the apothecaries shops. See the article MEDICINE.

OFFICIO, or SUSPENSION AB OFFICIO. See the article SUSPENSION.

OFFIDA, a town of Italy, subject to the pope, twenty-six miles south of Loretto.

OFFING, or OFFIN, in the sea-language, that part of the sea a good distance from shore, where there is deep water, and no need of a pilot to conduct the ship: thus, if a ship from shore be seen sailing out to seaward, they say, she stands for the offing: and if a ship, having the shore near her, have another a good way without her, or towards the sea, they say, that ship is in the offing.

OFF-SETS, in gardening, are the young shoots, that spring from the roots of plants; which being carefully separated, and planted in a proper soil, serve to propagate the species.

OFF-SETS, in surveying, are perpendiculars let fall, and measuring from the stationary lines to the hedge, fence, or extremity of an enclosure. See the article SURVEYING.

OGEE, or O. G. in architecture, a moulding, consisting of two members, the one concave, and the other convex; or, of a round and a hollow, like an S. See MOULDING and CYMATIUM.

OGIVE, in architecture, an arch, or branch of a gothic vault; which, instead of being circular, passes diagonally from one angle to another, and forms a cross with the other arches. See the articles ARCH, VAULT, &c. The middle, where the ogives cross each other, is called the key; being cut in form of a rose, or a cul de lampe. The members or mouldings of the ogives are called nerves, branches, or reins; and the arches which separate the ogives, double arches.

OGLIO, a river which rises in the Alps, in the county of Trent, and, after running southward, thro' the lake Isco and dutchy of Mantua, falls into the Po, a little west of Borgoforte.

OGLIO, or OLIO, in cookery. See the article OLIO.

OHIO, a large river of north America, which, taking its rise in the mountains of Pensylvania, runs south-west; and, after receiving many considerable branches, falls into the Messassippi.

OHNSPACH, or ANSPACH. See the article ANSPACH.

OIL, *oleum*, in natural history, an unctuous inflammable substance, drawn from several natural bodies, as animal and vegetable substances.

Animal oils are their fats, which are originally vegetable oils: all animal substances yield them, together with their volatile salts, in distillation.

Vegetable oils are obtained by expression, infusion, and distillation.

The oils by expression are obtained from the seed, leaves, fruit, and bark of plants; thus, the seed of mustard, and of the sunflower, almonds, nuts, beech mast, &c. afford a copious oil by expression; and the leaves of rosemary, mint, rue, wormwood, thyme, sage, &c. the berries of juniper, olives, indian cloves, nutmeg, mace, &c. the barks of cinnamon, sassafras, and clove, yield a considerable proportion of essential oil by distillation.

The method of procuring oils by expression is very simple; thus, if either sweet

or bitter almonds, that are fresh, be pounded in a mortar, the oil may be forced out with a press, not heated: and in the same manner should the oil be pressed from linseed and mustard. The avoiding the use of heat in preparing these oils, intended for internal medicinal use, is of great importance, as heat gives them a very prejudicial rancidness.

This method holds of all those vegetable matters that contain a copious oil, in a loose manner, or in certain cavities or receptacles; the sides whereof being broke, or squeezed, makes them let go the oil they contain: and thus the zest or oil of lemon-peel, orange-peel, citron-peel, *&c.* may be readily obtained by pressure, without the use of fire. But how far this method of obtaining oils may be applied to advantage, seems not hitherto considered. It has been commonly applied to olives, almonds, linseed, rape-seed, beech-mast, ben-nuts, walnuts, bay-berries, mace, nutmeg, *&c.* but not that we know of to juniper-berries, cashew-nuts, indian cloves, pine-apples, and many other substances that might be enumerated, both of foreign and domestic growth. It has, however, been of late successfully applied to mustard-seed, so as to extract a curious gold coloured oil, leaving a cake behind, fit for making the common table mustard.

Certain dry matters, as well as moist ones, may be made to afford oils by expression, by grinding them into a meal, which being suspended to receive the vapour of boiling water, will thus be moistened so as to afford an oil, in the same manner as almonds; and thus an oil may be procured from linseed, hemp-seed, lettuce-seed, white poppy-seed, *&c.*

As to the treatment of oils obtained by expression, they should be suffered to depurate themselves by standing in a moderately cool place, to separate from their water, and deposite their fæces; from both which they ought to be carefully freed. And if they are not thus rendered sufficiently pure, they may be washed well with fresh water, then thoroughly separated from it again, by the separating-glass, whereby they will be rendered bright and clear.

The next class of oils are those made by infusion, or decoction, wherein the virtues of some herb or flower is drawn out in the oil; as the oils of roses, chamæmile, hypericum, elder, *&c.* However, these require to be differently treated: thus, for the scented flowers, particularly roses, insolation does best; because much boiling would exhale their more fragrant parts: but oils impregnated with green herbs, as those of chamæmile and elder, require long boiling, before they receive the green colour desired. And, in general, no oils will bear to be boiled any longer than there remains some aqueous humidity, without turning black.

There are many compound oils prepared in the same manner, *viz.* by boiling and insolation, and then straining off the oil for use.

The same contrivance has likewise its use in making essences for the service of the perfumer; not only where essential oils cannot be well obtained in sufficient quantities, but also where they are too dear. The essential oil of jessamin-flowers, honey-suckles, sweet-briar, damask-roses, lillies of the valley, *&c.* are either extremely dear, or scarce obtainable by distillation; and, in some of them, the odorous matter is so subtile, as almost to be lost in the operation. But if these flowers be barely infused in fine oil of nuts, or oil of ben, drawn without heat, and kept in a cool place, their subtile odorous matter will thus pass into the oil, and richly impregnate it with their flavour. And these essences may be rendered still more perfect by straining off the oil at first put on, and letting it stand again, without heat, upon fresh flowers; repeating the operation twice or thrice.

Oils, or fats, may likewise be obtained, by boiling and expression, from certain animal substances; for the membranes which contain the fat, being chopped small, and set in a pan over the fire, become fit for the canvas-bag, and, by pressure, afford a large quantity of fat; as we see in the art of chandlery, which thus extracting the oily matter, leaves a cake behind, commonly called graves. See the article CANDLE.

As to the essential oils of vegetables, they are obtained by distillation, with an alembic and a large refrigeratory. Water must be added to the materials, in sufficient quantity, to prevent their burning; and they should be macerated or digested in that water, a little time before distillation. The oil comes over with the water, and either swims on the top, or sinks to the bottom, according as it is specifically heavier or lighter than water. See DISTILLATION and GRAVITY.

This process is applicable to the distilling of

of the essential oils from flowers, leaves, barks, roots, woods, gums, and balsams, with a slight alteration of circumstances, as by longer digestion, brisker distillation, *&c.* according to the tenacity and hardness of the subject, the ponderosity of the oil, *&c.*

Essential oils may be divided into two classes, according to their different specific gravities; some floating upon water, and others readily sinking to the bottom. Thus, the essential oils of cloves, cinnamon, and sassafras, readily sink; whereas those of lavender, marjoram, mint, *&c.* swim in water: the lightest of these essential oils, is, perhaps, that of citron-peel, which even floats in spirit of wine; and the heaviest seems to be oil of sassafras.

For obtaining the full quantity of the more ponderous oils from cinnamon, cloves, sassafras, *&c.* it is proper to reduce the subjects to powder; to digest this powder for some days in a warm place, with thrice its quantity of soft river-water, made very saline by the addition of sea-salt, or sharp with oil of vitriol; to use the strained decoction, or liquor left behind in the still, instead of common water, for fresh digestion; to use for the same purpose the water of the second running, after being cleared of its oil; not to distil too large a quantity of these subjects at once; to leave a considerable part of the still, or about one fourth empty; to use a brisk fire, or a strong boiling heat, at the first, but to slacken it afterwards; to have a low still-head, with a proper internal ledge and current leading to the nose of the worm; and, finally, to cohobate the water, or pour back the liquor of the second running upon the matter in the still, repeating this once or twice.

The directions here laid down for obtaining the ponderous oils to advantage, are easily transferred to the obtaining of the lighter; so that we need not dwell particularly upon them.

Many of the essential oils being dear, it is a very common practice to adulterate or debase them several ways, so as to render them cheaper both to the seller and the buyer. These several ways seem reducible to three general kinds, each of which has its proper method of detection, *viz.* 1. With expressed oils. 2. With alcohol. And, 3. With cheaper essential oils.

If an essential oil be adulterated with an expressed oil, it is easy to discover the fraud; by adding a little spirit of wine to a few drops of the suspected essential oil, and shaking them together; for the spirit will dissolve all the oil that is essential, or procured by distillation, and leave all the expressed oil that was mixed with it, untouched.

If an essential oil be adulterated with alcohol, or rectified spirit of wine, it may be done in any proportion, up to that of an equal quantity, without being easily discoverable either by the smell or taste: the way to discover this fraud, is to drop a few drops of the oil into a glass of fair water: and if the oil be adulterated with spirit, the water will immediately turn milky, and, by continuing to shake the glass, the whole quantity of spirit will be absorbed by the water, and leave the oil pure at top.

Finally, if an essential oil be adulterated by a cheaper essential oil, this is commonly done very artfully: the method is to put fir-wood, turpentine, or oil of turpentine into the still, along with the herbs to be distilled for their oil, such as rosemary, lavender, origanum, *&c.* and, by this means, the oil of turpentine distilled from these ingredients, comes over in great quantity, and intimately blended with the oil of the genuine ingredient. The oils thus adulterated always discover themselves in time, by their own flavour being overpowered by the turpentine-smell; but the ready way to detect the fraud, is to drench a piece of rag, or paper, in the oil, and hold it before the fire; for thus the grateful flavour of the plant will fly off, and leave the naked turpentine-scent behind.

The virtues of oils being the same with those of the substances from whence they are obtained, may be learned under their several articles.

As for the oils of beech, bricks, cloves, *&c.* see the articles Beech, Brick, *&c.*

Oil is well known to stop the violent ebullition of various substances: thus, if sugar, honey, *&c.* be boiling, and in danger of rising over the sides of the vessel, the pouring in a little oil, makes it immediately subside.

Oil-mill, one that serves to bruise or break the nuts, olives, and other fruits and grains, whose juice is to be drawn by expression, to make oil; the structure of which is described under the article Olive.

Oil, in commerce, makes a very considerable article. Ordinary oil of olives from any

any place, not otherwife rated, pays on importation 6 l. 13 s. $2\frac{40}{100}$ d. the ton, and draws back on exportation 5 l. 8 s. more, if in a foreign bottom, 8 s. Provence-oil pays, on importation, the ton, 21 l. 13 s. $2\frac{40}{100}$ d. and draws back on exportation 12 l. 18 s. Oil of hemp-feed pays on importation, the ton, 11 l. 7 s. and draws back on exportation 10 l. 17 s. 6 d. Rape and linfeed-oil pay, on importation, the ton, 20 l. 19 s. 6 d. and draw back on exportation 19 l. 6 s. 3 d. Other feed-oils, for every 20 s. value, pay on importation 3 s. $10\frac{20}{100}$ d. and draw back on exportation 3 s. $4\frac{1}{2}$ d. and befides, for every ton 7 l. 10 s. on importation, and draw back 7 l. 10 s. on being exported. Sallad-oil pays on importation, the gallon, $11\frac{55}{100}$ d. and draws back on exportation $10\frac{12\frac{1}{2}}{100}$ d. Sevil, Majorca, Minorca, Apuglia, and Portugal-oil, pay on importation, the ton, 6 l. 3 s. $2\frac{40}{100}$ d. and draw back on exportation 5 l. 8 s. Train-oil, or blubber of whales, and whale-fins, as alfo the fkins, oil, blubber, or other produce whatever of feals, and other creatures, taken and caught in the Greenland-feas, Davis's ftreights, or any other parts of the feas adjoining, were to be imported duty-free till December 25, 1757, and from thence to the end of the then next feffion of parliament; and the fame brought from Newfoundland, or any other of his majefty's colonies, caught and imported in fhips belonging to England, Wales, or Berwick upon Tweed, is alfo imported duty-free. Every ton of fuch oil, taken by fhipping belonging to any of his majefty's colonies, and imported in fuch fhipping, pays 11 s. $8\frac{40}{100}$ d. and draws back on exportation 8 s. $10\frac{20}{100}$ d. Every ton of fuch oil taken by the faid fhipping, but imported in fhips belonging to England, Wales, or Berwick upon Tweed, pays 5 s. $10\frac{20}{100}$ d. and draws back on exportation 4 s. $5\frac{10}{100}$ d. If caught and imported by foreigners, it pays by the ton 15 l. 16 s. and draws back on exportation 11 l. 10 s. 6 d.

Oil *of the earth, oleum terræ*, a mineral fluid, of the confiftence of a fyrup in winter, but in warm weather is little thicker than oil of olives. It is of a dufky black colour, very readily inflammable, and burning with a white but not very brifk or vivid flame. The oleum terræ is found in Sumatra, where it is efteemed in paralytic diforders, ufed externally as an embrocation.

Oil *of petre*, or *Rock*-Oil. See the article Petroleum.

Oil-Beetle, *Meloe*, in zoology. See the article Meloe.

OINTMENT, or Unguent, in pharmacy and furgery. See Unguent.

OISANS, a town of France, in the province of Dauphine, eighteen miles fouth-eaft of Grenoble.

OISTER, or Oyster. See Oyster.

OKEHAM, the capital of Rutlandfhire, fourteen miles eaft of Leicefter: weft long. 45′, and north lat. 52° 40′.

OKER, or Ochre, in natural hiftory. See the article Ochre.

OLAX, in botany, a genus of the triandria-monogynia clafs of plants, the calyx of which confifts of a fingle-leafed concave, fhort perianthium; the corolla is funnel-fhaped; but the plant not being fufficiently known, the fruit is not defcribed.

OLDELSLO, a town in the circle of lower Saxony and dutchy of Holftein, feventeen miles weft of Lubec: it is fubject to Denmark.

OLDENBURG, the capital of the county of the fame name in Weftphalia: eaft long. 7° 32′, and north lat. 53° 35′.

Oldenburg is alfo a town of Germany, in the dutchy of Holftein, thirty-two miles north of Lubec.

OLDENDORP, a town of Germany, in the circle of Weftphalia, thirty miles fouth-weft of Hanover.

OLDENLANDIA, a genus of the tetrandria-monogynia clafs of plants, the flower of which confifts of four oval patent petals, twice as long as the cup; and its fruit is a coreaceous globular capfule, containing two cells, with numerous very fmall feeds in each.

OLDENZEL, a city of the united Netherlands, in the province of Overyffel: eaft long. 6° 50′, and north lat. 52° 30′.

OLDESLOE, a town of Germany, in the dutchy of Holftein, fifteen miles weft of Lubec.

OLD-WIFE-FISH, the name of a fpecies of the baliftes, with three fpines on the back, and a forked tail. See Balistes.

Old-wife, or Wrasse. See Wrasse.

OLEA, the olive-tree, in botany. See the article Olive.

OLEAGINOUS, fomething that partakes of the nature of oil, or out of which oil may be expreffed.

OLECRANUM, or Olecranon, in anatomy,

tomy, the posterior apophysis of the ulna, serving to form the eminence of the elbow. See ULNA and ELBOW.

OLERON, an island of France, near the coast of Poictou, fourteen miles south-west of Rochelle, being about fifteen miles long, and six broad.

Sea-laws of OLERON, certain laws relating to maritime affairs, made in the time of Rich. I. when he was at the island Oleron.

These laws, being accounted the most excellent sea-laws in the world, are recorded in the black book of the admiralty.

OLERON, is also a city of Gascony in France, thirty miles south of Dax.

OLESCO, a town of Upper Volhinia, in Poland: east longitude 24°, and north latitude 50°.

OLEUM, OIL. See the article OIL.

OLFACTORY NERVES, the first pair of the head; so called from their being the immediate instruments of smelling. See the article NERVES.

OLIBANUM, FRANK-INCENSE, in pharmacy, a dry resinous substance, brought to us in detached pieces, or drops as it were, like those of mastic; but larger, and of a less pure and pellucid texture.

It is of a pale yellowish-white colour, but with some mixture of a brownish cast in it. It is moderately heavy; its smell is strong, but not disagreeable; and its taste bitter, acrid, and resinous. The drops of olibanum sometimes adhere two or more together; and, when two oblong and small ones adhere to one another, fanciful writers have called such male frank-incense, from the resemblance of a man's testicles; and, when two larger and rounder pieces adhered, they likened it to a woman's breasts, and called it female frank-incense: and hence the origin of the thus testiculosum, and thus mammosum of these writers. Sometimes four or five of these granules were found adhering to the bark of the tree; this was called the cluster frankincense: and the small fragments broke off from the rest in the carriage, were preserved separately, and made another kind, under the name of manna thuris, the manna of frank-incense. How idle and ridiculous were such distinctions among people, who knew at the same time, that the drug was the same under all these accidental forms!

Olibanum is to be chosen whitish, pure, dry, and as much approaching to pellucidity as may be. It has been known the most universally of any drug, perhaps, in the world, and that from as early times as those of Theophrastus and Dioscorides, who describe it under the name of libanos, and Hippocrates also mentions it under that of libanoton. The Latins call it thus and tus; and the Arabians, rouder, conder, and hateth.

The earliest accounts we have of any thing, tell us that frank-incense was in use among the sacred rites and sacrifices; and it is used in many different parts of the world at this time, to the same purposes. As well, however, as the world has been at all times acquainted with the drug itself, we are not yet well acquainted with its history. The country which produces it is a much disputed point among authors: some affirm it was never found any where but in Arabia, and there only in that part called Sabæa, or, from this famous product, Arabia Thurifera: others are for bringing it from Ethiopia; and others from other places. If we are uncertain as to the place whence the olibanum is brought, we are much more as to the tree that produces it.

Olibanum is greatly commended by many against disorders of the head and breast, and against diarrhœas and dysenteries, and profluvia of the menses, and fluor albus. Its dose is from ten grains to a drachm. It is esteemed by many a specific in pleurisies, especially when epidemic.

Externally it is used in fumigations for disorders of the head, and against catarrhs; and is an ingredient in some plasters. It is a noble balsam in consumptions, given in substance, or dissolved with the yolk of an egg, into the form of an emulsion. There is an oil made of it per deliquium, in the same manner as that of myrrh: this is done by putting the powder of it in the white of a boiled egg, in a cellar, till it runs into a liquor; this is esteemed a great cosmetic, and destroyer of pimples in the face. Dioscorides had his doubts about the internal use of olibanum in large doses; he talks of its bringing on madness, and even death; but none of the other Greek writers say any thing of its ill qualities, nor do we at present know any of them.

OLIGAEDRA, in natural history, the name of a genus of crystals, and expresses that which is composed of only a few planes. See the article CRYSTAL.

The bodies of this class are crystals of the

the imperfect kind, being composed of columns affixed irregularly to some solid body at one end, and at the other terminated by a pyramid; but the column and pyramid being both pentangular, the whole consists only of ten planes, and not, as the common kind, of twelve. Of this genus there are only three known species; 1. A whitish one, with a short pyramid, found principally in Germany, and sometimes brought over to us, among parcels of common crystal. 2. A bright and colourless one, with a longer pyramid. This is found in Germany, and in some parts of England, as in the tin mines of Cornwal, and on Mendip hills. And, 3. A brown one, with a scabrous crust. This is produced only in the East Indies, and is well known by our lapidaries by its rough coat, and is esteemed the finest of all brown crystals.

OLIGARCHY, a form of government, wherein the administration of affairs is lodged in the hands of a few persons. See the article GOVERNMENT.

OLINDA, a city and port-town of Brasil: west long. 35°, and south lat. 8°.

OLIO, or OGLIO, in cookery, denotes a savoury dish composed of a great variety of ingredients, chiefly used by the Spaniards.

OLITE, a town of Navarre, in Spain, twenty-five miles south of Pameluna.

OLIVA, a port-town of Poland, in the province of regal Prussia, only six miles west of Dantzic.

OLIVARIA CORPORA, in anatomy, two eminences of the medulla oblongata; so called from their resembling an olive in shape.

OLIVE, *olea*, in botany, a genus of trees belonging to the diandria-monogynia class of plants, with a monopetalous flower divided into four segments at the limb; the fruit is an unilocular drupe, of a somewhat oval shape, containing an ovato-oblong rugose nut, with a kernel of the same shape.

Olives are very oily and smooth, and therefore not good for the stomach, being apt to pall and relax it too much. The oil of olives is judiciously mixed with cataplasms of a maturating nature: it is accounted heating, emollient, and vulnerary; and good against costiveness and gripes.

In order to obtain the olive-oil, the olives are first bruised in a round trough, under a mill-stone, rolling perpendicularly over them; and when sufficiently mashed, put into the maye, or trough, *m*, of an olive-press (plate CLXXXVI. fig. 5.) where *a a* are the upright beams, or cheeks; *b*, the female, and *c*, the male-screw; *e*, the bar for turning the screw; *f*, the board on which the screw presses; *g*, a cubical piece of wood, called a block; *h*, the peel, a circular board, to be put under the block. By turning the screw, all the liquor is pressed out of the mashed olives, and is called virgin-oil; after which, hot water being poured upon the remainder in the press, a coarser oil is obtained. Olive-oil keeps only about a year, after which it degenerates.

OLIVE-COLOUR, a yellow mingled with black. See the article COLOUR.

OLIVENZA, a town of Alentejo, in Portugal, ten miles south of Elvas.

OLMUTS, a city of Moravia, seventy-five miles north of Vienna.

OLONE, a port-town of France, thirty miles north-west of Rochelle.

OLSE, a town of Silesia, ten miles north of Breslaw.

OLNSNITZ, a town of Upper Saxony, sixty miles south-west of Dresden.

OLYMPIA, a port-town of the Morea, at present called Longinico: east long. 21° 35′, and north lat. 37° 40′.

OLYMPIAD, ὀλυμπιὰς, in chronology, the space or period of four years, whereby the Greeks reckoned time; for the epocha or commencement of which, see the article EPOCHA.

OLYMPIC GAMES were solemn games, famous among the antient Greeks, so called from Olympian Jupiter, to whom they were dedicated; and by some said to be first instituted by Jupiter, after his victory over the sons of Titan; others ascribe their institution to Hercules, not the son of Alcmena, but one of much greater antiquity; others, to Pelops; and others, to Hercules the son of Alcmena. These games were so considerable, that the Greeks made them their epocha, distinguishing their years by the return of the olympics. See the article EPOCHA.

The care and management of these games belonged, for the most part, to the Eleans, who, on that account, enjoyed their possessions without molestation, or fear of war or violence. They appointed a certain number of judges, who were to take care, that those who offered themselves as competitors, performed their preparatory exercises; and these judges, during the solemnity, sat naked, having before them a crown of victory, formed of wild-olive, which was presented to whomsoever they ad-

adjudged it. Thofe who were conquerors were called olympioniçes, and were loaded with honours by their countrymen. At thefe games, women were not allowed to be prefent; and if any woman was found to have paffed the river Alpheus, during the folemnity, fhe was to be thrown headlong from a rock.

OLYMPUS, the name of two mountains, the one in Bythinia, in the leffer Afia; and the other in the ifland of Cyprus.

OMAN, a province or kingdom in the fouth-eaft part of Arabia Felix.

OMBRE, a celebrated game at cards, borrowed from the Spaniards, and played by two, by three, or by five perfons, but generally by three. When three play at this game, nine cards are dealt to each party; the whole ombre pack being only forty, becaufe the eights, nines, and tens are thrown out of the pack. There are two forts of counters for ftakes, the greater and the leffer; the laft having the fame proportion to the other, as a penny to a fhilling: of the greater counters each man ftakes one for the game; and one of the leffer for paffing, for the hand when eldeft, and for every card taken in. As to the order and the value of the cards, the ace of fpades, called fpadillo, is always the higheft trump, in whatfoever fuit the trump be; the manille, or black duce, is the fecond: and the bafto, or ace of clubs, is always the third: the next in order is the king, the queen, the knave, the feven, the fix, the five, four, and three. Of the black there are eleven trumps; of the red, twelve. The leaft fmall cards of the red are always the beft, and the moft of the black; except the duce and red feven, both of which are called the manilles, and are always fecond when the red is a trump. The red ace, when a trump, enters into the fourth place, and is called punto, otherwife it is only called an ace. The three principal cards are called matadores, which have this privilege, that they are not obliged to attend an inferior trump when it leads; but, for want of a fmall trump, the perfon may renounce trumps, and play any other card; and when thefe are all in the fame hand, the others pay three of the greater counters a-piece; and with thefe three for a foundation, he may count as many matadores as he has cards in an uninterrupted feries of trumps; for all which the others are to pay one counter a-piece. He who hath the firft hand is called ombre, and has his choice of playing the game, of naming the trump, and of taking in as many and as few cards as he pleafes; and after him the fecond, &c. But if he does not name the trump before he look on the cards he has taken in, any other may prevent him, by naming what trump he pleafes. He that has the firft hand, fhould neither take in, nor play, unlefs he has at leaft three fure tricks in his hand; for, as he wins the game, who wins moft tricks, he that can win five of the nine, has a fure game: which is alfo the cafe if he wins four, and can fo divide the tricks as that one perfon may win two, and the other three.

If a perfon plays without difcarding or changing any cards, this is called playing fans prendre; and if another wins more tricks than he, he is faid to win codille. The over-fights in the courfe of the game, are called beafts. And if the ombre wins all the nine tricks, it is called winning the vole.

In ombre by five, which many, on account of its not requiring fo clofe an attention, prefer to that by three, only eight cards-a-piece are dealt; and five tricks muft be won, otherwife the ombre is beafted. Here, the perfon who undertakes the game, after naming the trump, calls a king to his affiftance; upon which the perfon in whofe hand the king is, without difcovering himfelf, is to affift him as a partner, and to fhare his fate. If, between both, they can make five tricks, the ombre wins two counters, and the auxiliary king only one; but when the counters are even, they divide them equally. If the ombre venture the game without calling in any king, this too is called playing fans prendre; in which cafe the other four are all againft him, and he muft win five tricks alone, or be beafted. The reft is much the fame as by three.

OMBRE DE SOLEIL, SHADOW OF THE SUN, in heraldry, is when the fun is borne in armory, fo as that the eyes, nofe, and mouth, which at other times are reprefented, do not appear; and the colouring is thin, fo that the field can appear through it.

OMBRIA, the antient name of a province of Italy, in the territory of the pope, now called Spoletto and Perugia.

OMBRO, or LOMBRO, a town of Italy, in the dutchy of Tufcany, and territory of the Siennois, fituated near the Tufcan fea, a little fouth of the lake of Caftiglione, forty-five miles fouth-weft of Sienna.

OMELET, or AMLET, a kind of pancake or fricaffee of eggs, with other ingredients, very ufual in Spain and France. It may be made as follows: the eggs being beaten, are to be feafoned with falt and pepper, and then fried in butter, made boiling hot; this done, gravy is to be poured on, and the whole ftewed with chives and parfley, fhred fmall: when one fide is fried enough, it is to be turned on the other.

OMEN, a certain accident and cafual occurrence, that was thought to prefage either good or evil. There were three forts of omens among the antients; one was of things internal, or thofe which affected the perfons themfelves; the fecond, of things external, that only appeared to men, but did not make any impreffion on them; the third were ominous words. Of the firft fort were thofe fudden confternations, called panic fears, that feized upon men without any vifible caufe, and were therefore imputed to the dæmons, efpecially the god Pan: of thefe panics there is frequent mention in hiftory. The fecond fort of omens were of fuch things as appeared to men, but were not contained in their own bodies: of thefe there were feveral forts; the beginning of things were thought to contain fomething ominous; it was thought a direful omen, when any thing unufual befel the temples, altars, or ftatues of the gods; under the head of external omens are to be placed thofe which offered themfelves in the way; fuch were the meeting of an eunuch, a black, a bitch with whelps, a fnake lying in the road, &c. Words were ominous, and as they were good or bad, were believed to prefage accordingly.

OMENTUM, or EPIPLOON, the CAWL, in anatomy, a membranaceous part, ufually furnifhed with a large quantity of fat; being placed under the peritonæum, and immediately above the inteftines. See the article INTESTINES.

It is called by fome rete, and reticulum, from the number of holes appearing in it, when raifed, and giving it the refemblance of a net.

As to its fituation, it ufually occupies only the upper part of the abdomen; though it is fometimes found extended to the lower part: its weight in a perfon not remarkably fat or lean, is about half a pound: its lower part is evidently loofe and free; but in its upper part it is joined, anteriorly, to the bottom of the ftomach, the duodenum, and the fpleen; and pofteriorly to the colon and pancreas.

It is compofed of a very tender double membrane, forming a kind of pouch or cavity, called its burfa, and replete with fat, lodged in certain cellules, forming a kind of ducts, with certain areolæ, or membranaceous fpaces between them. Its arteries come from the cœliac, and are very numerous; its veins arife chiefly from the fplenic branch of the vena portæ; and its nerves are from the intercoftals and the par vagum. See the articles ARTERY, VEIN, &c.

It has a very remarkable aperture, by which it may be conveniently diftended by inflation; and there are generally fome fmall holes in it, though the large ones, from which it got the name rete, are adventitious.

The ufes of the omentum are, 1. By its lubricity, to render the natural and neceffary motions of the inteftines eafy. 2. To cherifh and defend the inteftines from cold. 3. To affift in the formation of the bile, the fatty part of which is wholly owing to the veffels of the omentum; every thing that returns from this part going to the liver. 4. To temperate the acrimony of the humours. And, probably, 5. To ferve, as all the other fat of the body, to give it nourifhment, when it is incapable of being nourifhed any other way.

Falling down of the OMENTUM. On large wounds of the abdomen, the omentum will frequently protrude itfelf through the wound, either alone, or with fome portion of the inteftines. When this is the cafe, the firft bufinefs is to enquire whether the protruded part preferves its heat, moifture, and natural colour: if it is not found faulty in any of thefe circumftances, it muft be gently returned; but when the ftraitnefs of the wound forbids this, the protruded part muft be taken off clofe to the wound, and the wound healed according to the common form. The omentum in this cafe will adhere to the internal part of the wound, without bringing on any diforder, or inconvenience to the patient. But where the inteftines fall out at the fame time, the omentum is to be fomented, by an affiftant, with warm milk and water, till the inteftines are returned. See the article INTESTINES.

If any part of the protruded omentum be cold, dry, livid, putrid, or corrupted, the mortified part muft be entirely cut

cut off before the reſt is returned, leſt the neighbouring parts ſhould be brought into conſent, which would inevitably prove fatal to the patient. Heiſter directs that the corrupted part be taken off in this manner: paſs a waxed thread two or three times round the ſound part of the omentum, near the place where it is injured, and faſten it with a knot, to prevent any hæmorrhage from enſuing after the reduction of it; when you have made a ſecure ligature, take off the corrupted part with the knife, or ſciſſars, and return what is ſound, leaving, at leaſt, the length of a foot of the ligature hanging out of the wound of the abdomen, till it ſlips off from the ſound part of the omentum. The wound muſt be dreſſed in the common way, the depending part of it being kept open by a large tent: and, at every dreſſing, the ligature muſt be pulled a little gently forward, till it has, at length, entirely ſlipped off from the ſound part of the omentum.

OMERS, or St. Omers, a city of Artois, in the french Netherlands, twenty miles ſouth of Dunkirk, and eighteen ſouth eaſt of Calais.

OMITTAS, or non omittas. See the article Non omittas.

OMLANDS, a diviſion of the province of Groningen, in the United Provinces.

OMMEN, a town of the United Netherlands, in the province of Overyſſel, ſituated on the leſſer Vecht, ſeventeen miles north-eaſt of Deventer.

OMMENBURG, or Amelburg, a town of Germany, in the landgravate of Heſſe, ſituated five miles eaſt of Marpurg.

OMOPHAGIA, an antient greek feſtival, in honour of Bacchus, ſurnamed Omophagos, *i. e.* eater of raw fleſh. This feſtival was obſerved in the ſame manner with the other feſtivals of Bacchus, in which they counterfeited madneſs; what was peculiar to it, was that the worſhipers uſed to eat the entrails of goats, raw and bloody, in imitation of the god, who was ſuppoſed to do the ſame thing.

OMOPHORIUM, in church-hiſtory, a little cloak, antiently wore by the biſhops, over their ſhoulders.

OMOPLATE, in anatomy, is uſed in general for the ſhoulder, but more particularly for the two bones ſituate on the hinder part of the upper ribs, one on each ſide, called alſo ſcapulæ and ſhoulder-blades. See the article Scapula.

Theſe bones are broad, and eſpecially in the middle; thick in their apophyſes, of a triangular form, concave within, and convex without, and are joined to the clavicles.

OMPHACIUM, in pharmacy, the juice of unripe grapes: alſo a name given by ſome to a kind of oil, pretended to be drawn from olives while green and ſour: but others charge it as an impoſture, and affirm that olives yield no oil at all till perfectly ripe.

OMPHALOCELE, in ſurgery, the ſame with exomphalus. See Exomphalus.

OMPHALO-MESENTERIC, in anatomy. All fœtuſes are wrapped up in at leaſt two coats or membranes; moſt of them have a third, called allantoides, or urinary. See Allantois and Foetus. Some, as the dog, cat, hare, &c. have a fourth, which has two blood-veſſels, *viz.* a vein and an artery, called omphalo-meſenterics, becauſe paſſing along the ſtring to the navel, and terminating in the meſentery.

ONANDAGOES, one of the tribes of the Iroquois, or Five Nations, ſituated on the lake Ontario, or Frontenac, in North America: they are Allies of Great Britain.

ONANIA, or Onanism, terms which ſome late empirics have framed, to denote the crime of ſelf-pollution, mentioned in ſcripture to have been practiſed by Onan, and puniſhed in him with death. See the article Pollution.

ONEGA-lake, a lake upwards of an hundred miles long, and forty broad, ſituated in the empire of Ruſſia, between 61° and 63° of north lat. and 35° eaſt longitude.

ONEGLIA, a port-town of Italy, ſeventy miles ſouth-weſt of Genoa, ſubject to the king of Sardinia: eaſt long. 8° 30′, and north lat. 44°.

ONEIROCRITICA, ονειροκριτικη, the art of interpreting dreams, or predicting future events from dreams. See the article Divination.

Oneirocritics have eſtabliſhed three kinds of dreams, from which events may be predicted: 1. When the gods, or ſpirits, were ſuppoſed to converſe with men in their ſleep, and reveal to them future events. 2. When the images of the things themſelves were repreſented in viſion. 3. When future events were revealed by types and figures. Of the firſt kind was Agamemnon's dream, in the ſecond Iliad, where the ſhape of Neſtor, adviſed him to give the Trojans battle,

 pro-

promising him success and victory. Of the second sort was that of Alexander, who dreamed that he was to be murdered by Cassander. And of the last species was that of Hecuba, who dreamed she had conceived a firebrand.

ONERANDO PRO RATA PORTIONIS, in law, a writ issued in behalf of a joint-tenant, or tenant in common, who is distrained for more rent than his proportion of the land does come to.

ONGAR, a market-town of Essex, ten miles west of Chelmsford.

ONGLE'E, in heraldry, an appellation given to the talons or claws of beasts or birds, when borne of a different colour from that of the body of the animal.

O. NI. a latin contraction used in the exchequer, by the sheriff, when he makes up his accounts for issues, amercements and mean profits; at which time he marks upon each head O. NI. thereby to denote, *Oneretur, nisi habeat sufficientem exonerationem*; that is, let him be charged, unless he have a sufficient discharge: whereupon he becomes the king's debtor, and a debet or debt is set upon his head; in which case the other parties are debtors to the sheriff.

ONION, *cepa*, in botany, *&c.* See CEPA.

ONISCUS, in zoology, a genus of insects, which have limbs, but no wings, and which have oblong bodies and numerous legs, or more than six pairs. The characters of the oniscus are, that the body is short and broad, and approaching to an oval figure; the legs are seven or eight on each side; the more usual number is seven. This genus comprehends the several sorts of wood lice, and the millepes.

ONKOTOMY, in surgery, the operation of opening a tumour, or abscess. See the articles TUMOUR and ABSCESS.

ONOCLEA, in botany, a genus of the cryptogamia filices class: the fruit consists of several globular capsules, with five valves and one cell, in which are several, long, small, hairy seeds.

ONOCROTALUS, in ornithology, a bird commonly called the pelican. See the article PELICAN.

ONOMANCY, or rather ONOMAMANCY, ονομαμαντεια, a branch of divination, which foretels the good or bad fortune of a man, from the letters in his name. See the article DIVINATION.

From much the same principle the young Romans toasted their mistresses as often as there were letters in their names: hence Martial says,

Naevia sex cyathis, septem Justina bibatur.

ONOMATOPOEIA, in grammar and rhetoric, a figure where words are formed to resemble the sound made by the things signified; as the buz of bees, the cackling of hens, *&c.*

ONONIS, or ANONIS, REST-HARROW, in botany, a genus of the diadelphia decandria class of plants, the calyx of which is a perianthium cut into five segments, and almost of the length of the corolla, which is of the butterfly kind: the fruit is a turgid, hairy pod, with two valves, and one cell, in which are a few kidney-shaped seeds. See the article ANONIS, and plate XVIII. fig. 5.

The root and leaves of this plant are accounted attenuant and discutient, being chiefly prescribed in the jaundice and obstructions of the viscera, the piles, *&c.*

ONOPORDUM, the COTTON-THISTLE, a genus of the syngenesia-polygamia-aequalis class of plants, the compound flower of which is tubulose; and the proper ones monopetalous and funnel-fashioned; the seeds are single, crowned with down, and contained in the bottom of the cup.

ONOS, in ichthyology, the HADDOCK. See the article HADDOCK.

ONOTH, a town of Hungary, fifty miles north-east of Buda, subject to the house of Austria.

ONRUST, a small island at the mouth of the harbour of Batavia in the East-Indies.

ONSPACH, or ANSPACH. See the article ANSPACH.

ONTARIO, or FRONTENAC, a lake of North-America: situated in west long. 79°, and between 41° and 43° north lat.

ONTOLOGY, or ONTOSOPHY, the science or doctrine of being, in the general or abstract; coinciding with what is otherwise called metaphysics. See the article METAPHYSICS.

ONYCOMANCY, a species of divination by means of the nails of the fingers. See the article DIVINATION.

ONYX, in natural history, one of the semipellucid gems, with variously coloured zones, but none red; being composed of crystal, debased by a small admixture of earth; and made up either of a number of flat plates, or of a series of coats surrounding a central nucleus, and separated from each other by veins of a dif-

different colour, resembling zones or belts.

We have four species of this gem. 1. A bluish-white one, with broad white zones. 2. A very pure onyx, with snow-white veins. 3. The jasponyx, or horney-onyx, with green zones. 4. The brown onyx, with bluish-white zones.

The antients attributed wonderful properties to the onyx; and imagined that if worn on the finger it acted as a cardiac: they have also recommended it as an astringent, but at present no regard is paid to it.

OOST, a kiln for drying hops after they are picked from the stalks.

This is a square room built up of brick or stone, ten feet wide, more or less, and with a door on one side: in the midst of this room is a fire-place, about thirteen inches wide, and as much high; and in length reaching so nearly to the back of the kiln, that a man has just room to go round it. This fire-place is called a herse, and the fire is let out into the room by several holes in the sides. Five feet above this, is laid the floor on which the hops are to be laid to dry, and this must have a wall round it of four feet high, to keep the hops from falling out: at one side of the upper bed must be made a window to put out the hops as they are dried, into a room prepared for them: the beds may be made of laths an inch square, placed at a quarter of an inch distance from one another, and supported by beams underneath; or it may be made of the same laths placed lattice-wise, and covered with large plates of double tin, taking care that the tin plates be well soldered; or instead of these plates, the new invented tiles filled with holes may be used: the hops are to be poured on this bed till it is covered about a foot thick with them, and they being spread even with a rake, the fire is to be lighted in the fire-place below: some recommend a wood fire, but experience shews that nothing does so well as charcoal; the fire must not be too fierce at first, and must not sink or slacken, but rather increase, till the hops are near dried, lest the moisture or sweat which the fire has raised, fall back and discolour them: if the floor is covered with tin plates, or the new invented tiles, the hops may be stirred about while drying, which will prevent those being scorched which would otherwise lie at the bottom. See the article HOP.

OOSTERGO, the north division of West-Friesland, one of the United Provinces.

OOZY *Ground*, a name given by the seamen to soft, slimy or muddy ground.

OPACITY, in philosophy, a quality of bodies which renders them impervious to the rays of light. See LIGHT.

The opacity and transparency of bodies in general are occasioned thus: let A B (plate CLXXXVIII. fig. 2. n° 1.) be the surface of an opake body A B C D, a ray of light G H falling thereon in the point H, will in part be reflected into the ray H I, and by this reflected ray, the point H becomes visible to the eye at I; and thus all the points, and consequently the whole surface, is made visible by that part of the light which it reflects. But the other part of the ray, entering into the body, being irregularly refracted and reflected through its internal substance of particles and pores, becomes divided, dissipated, absorbed and lost therein; and therefore, as none of the rays can come from the internal parts to the eye, so none of those parts can be visible; and the body in that case is said to be opake.

In order to this we must consider, that though the whole body be opake, yet the particles of such a body are not singly opake, but freely transmit the light without reflecting any part between the surfaces, and are therefore in themselves transparent; and were these particles contiguous to each other, the light would pass from one to another, and so through the whole, without reflection; as we find by experiment it will pass through several contiguous pieces of polished glass, and thus produce transparency. But if the particles do not touch in such a manner as to leave the interstices or pores exceeding small, there will be a reflection of light at every pore from the air which it there meets with, as being a medium of different density. For it is known by experiment, that though a ray of light will pass from one piece of glass to another that is contiguous, without reflection, yet will it not pass from the glass through the contiguous air without being in part reflected; consequently, where the pores are large and very numerous, there the reflection of light will be so great upon the whole as to cause a total dissipation and loss of the light that enters the body, and so render it opake. This is confirmed by taking ten pieces of clear glass, and laying them one upon another over a leaf of print quite dry, and having

only air between them; then taking ten other pieces of the same glass, and putting them into water, so that it may fill all their interstices; and then laying them on the same printed paper by the other, a person looking through each, will see the print, or reading, much more distinct, clear and bright through the latter pieces than through the former, the rays being more regularly transmitted through them where the density of the parts is not so unequal, and also with much less reflection than through the other, where the light undergoes a considerable reflection at every interstice or plate of air between the glasses.

It is hence also that transparent bodies are rendered opake by separating their parts, and rendering them more porous: thus beer, before it is raised into froth, is transparent; but the froth, by reason of its pores, becomes opake: thus dry paper is more opake than that which is wetted with water or oil, because more porous: thus the oculus mundi stone is more opake when dry than when steeped in water; and glass, reduced to powder, is no longer transparent. Hence it follows, that the parts of bodies, and their pores, must not be less than a certain definite bigness to render them opake; for the opakest bodies, if their parts be subtilely divided, becomes perfectly transparent: thus copper, dissolved in aqua-fortis, has all its particles pellucid; and the whole solution is transparent: thus a bubble blown off soap water, may become so thin on the top as to reflect no light, but will transmit the whole: thus water, salts, glass, stones, *&c.* though they are as porous as other bodies, yet their parts and interstices are too small to cause reflections in their common surfaces.

Therefore, in all transparent bodies, as B E F C, (*ibid.* n° 2.) a ray of light, K L, falling on its surface, in the point L, will there be in that part reflected, as before into the ray L M; the other part will go regularly, or in a rectilineal direction from the upper to the lower surface at N, where meeting with the air, (a medium of a different density) it will be in part reflected again into the ray N O; the other part goes out to the eye at P; by which means, all the internal parts from whence that ray comes, will be rendered visible to the eye: and since this may be conceived of every point in the body, it is easy to understand how the whole becomes transparent. See REFLECTION and REFRACTION.

OPAL, in natural history, a species of the chroastaces genus of gems. See the article CHROASTACES.

The opal is a gem of a very peculiar kind, and has been esteemed by many in all ages of very great value, though at present it is of less value, in proportion to its size, than any of the finer gems. It is softer than any other of the fine gems, and is difficult to polish to any degree of nicety. It is found of various shapes and sizes; its most frequent bigness is between that of a pea and a horse-bean, but it is found as small as the head of a large pin, and has been seen of the size of a large walnut. Its figure is very various and uncertain, but it is never found in a crystalliform or columnar state; its most usual shape is an irregularly oblong one, convex above, flatted at bottom, and dented with various sinuosities at its sides. It is often found among the loose earth of mountains, sometimes on the shores of rivers, and not unfrequently bedded in the coarser kinds of jasper. It is found in Egypt, Arabia, some parts of the East-Indies, and in many parts of Europe: those of Europe, are principally from Bohemia, and are of a greenish or greyish colour; the colour of other opals much resembles the finest mother of pearl, its basis seeming a bluish or greyish white, but with a property of reflecting all the colours of the rainbow, as turned differently to the light.

OPALIA, in antiquity, feasts celebrated at Rome in honour of the goddess Ops. Varro says they were held on the nineteenth of December, which was one of the days of the saturnalia: these two feasts were celebrated in the same month, because Saturn and Ops were husband and wife: the vows offered to the goddess were made sitting on the ground.

OPEN *flank*, in fortification, that part of the flank which is covered by the orillon. See the article FLANK.

OPENING *of trenches*, is the first breaking of ground by the besiegers, in order to carry on their approaches towards a place. See the article TRENCHES.

OPENING *of gates*, in astrology, is when one planet separates from another, and presently applies to a third; bearing rule in a sign opposite to that ruled by the planet, with which it was before joined.

OPERA,

OPERA, a dramatic compofition fet to mufic, and fung on the ftage, accompanied with mufical inftruments, and enriched with magnificent dreffes, machines, and other decorations. Bruyere fays, that it is effential to the opera to keep the mind, the eyes, and ears, in an inchantment. We derive the opera from the Venetians, among whom it is held one of the principal glories of the carnival. From the firft rife of the italian theatre, mufic has always been intermixed with action. The method of introducing it into the drama, has varied according to the feveral junctures. At firft it began by the chorus always being fung; then the prologues, interludes in verfe, and epilogue. When the theatre, by the final productions of a more polifhed age, began to improve, the practice of intermixing mufic with the reprefentation of true tragedies or comedies, wore out in twenty or thirty years, and both were reprefented in the tafte and fimplicity of the antients. By this fudden change we may eafily conceive that the ufe of mufic was quite laid afide, becaufe inconfiftent with thefe regular reprefentations. Sometime after, the poets abandoned that feverity for which they had been fo remarkable at the beginning of their reformation; nor does any italian writer inform us of the reafons. After that tragedies were reprefented without a chorus, mufic was again admitted into the prologue of comedies, and, by degrees, they introduced interludes which had no relation to the main fubject; fometimes thofe interludes were unconnected one with another, and each made an action apart; but very often, three or four interludes formed a continued action, which was a great embellifhment to the principal piece.

Formerly the opera comprehended all fubjects; but fince the machinery has been laid afide, it deals no longer in fables divinities, mufic, paftoral, and the like, but confines itfelf entirely to hiftory. The old operas that have come to our hands, are proofs of the italian genius in treating hiftorical fubjects: but at prefent a barrennefs of imagination feems to have fucceeded this fertility, the french tragedies being commonly pillaged to furnifh out their plans, their fcenes, and even their thoughts.

OPERATION, in general, the act of exerting or exercifing fome power or faculty, upon which an effect follows. The nobleft operation in men is that by the fchoolmen, called vital or immanent, *viz.* the operations of the mind; which, with regard to the underftanding, is threefold; apprehenfion or perception, difcretion or judgment, and reafoning or difcourfe; the direction of which makes the object of logic. See the article PERCEPTION, &c.

With regard to the will, the immanent operations are willing and nilling, to which are referred loving and hating. From the will alfo proceed fenfitive and locomotive operations, as feeing, fpeaking, walking, &c.

OPERATION, in chirurgery and medicine, denotes a methodical action of the hand on the human body, in order to re-eftablifh health. Chirurgical operations are performed differently and on various parts of the body, as blood-letting, and other operations of the like nature; operations on the head, on the eyes, the nofe, the mouth, the neck, the breaft, the abdomen, and the parts of generation; alfo operations of lithotomy, under which are included the high operation, the lateral operation, and the low operation: other operations are thofe in the art of midwifery, operations on the anus, on the extreme parts, &c. each of which are defcribed under their feveral heads, and referred to from the feveral fubjects. See PHLEBOTOMY, COUCHING, LITHOTOMY; as alfo, HEAD, NOSE, &c.

The beft authors on chirurgical operations in general, are Celfus, Ægineta, Paræus, Fabr. ab Aquapendente, Solingens, Nuchius, Verduc, Vauguion, Chauvriere, Dionis, Pafynus, Mafierus, Garangeot, Marinus, Heifter, Sharp, &c.

Operation is more particularly ufed in medicine, for the manner wherein any remedy produces its falutary effect; or that feries of actions, mediate or immediate, whereby its remote end is attained.

The feveral operations of each kind of medicines may be feen under their feveral heads. See EMETIC, DIURETICS, EMOLLIENTS, ERRHINES, &c.

OPERATIONS, in chemiftry, denote the proceffes or experiments whereby bodies are changed agreeably to the rules of the art, and to the end propofed therein. All chemical operations require a certain or determinate heat or degree of fire, in order to perform them with the greateft advantages; and this heat muft be affigned and obtained in every cafe, to the

the great improvement of chymiſtry. See the articles HEAT and FIRE.

The changes chymiſtry produces in bodies, are reducible to two kinds, *viz.* an union of parts and a ſeparation thereof: thus chymiſtry either ſeparates ſpirits, ſalts, oils, &c. or compounds them together. A chemical operation then conſiſts in changing the ſituation of the parts, particularly either in moving ſome parts, but not the whole, which is called ſeparating; or in adding new parts, which is called uniting. All chemical operations, therefore, are reducible to two general kinds, *viz.* ſuch whereby the parts of bodies before joined or united are ſeparated, which the antient chemiſts called ſolution; or ſuch whereby the parts before disjoined are combined or united, called coagulation. Some, however, object digeſtion as a third ſpecies of operation, but Boerhaave ſhews that it is a compoſition of both. Moſt chemiſts, however, look upon this diviſion as ſcarcely accurate and minute enough, and ſubdivide the art into a number of particular and ſubordinate operations, as calcination, vitrification, diſtillation, ſublimation, cohobation, amalgamation, fermentation, putrefaction, &c. See the articles CALCINATION, VITRIFICATION, &c.

Dr. Shaw obſerves that the different ſucceſs of chemical operations, may be greatly owing to the particular vapours or effluvia floating in the laboratory where ſuch operations are performed: thus if ſalt of tartar be run per deliquium where vinegar is diſtilling, it becomes regenerated tartar, a thing very different from that intended. See LABORATORY.

OPERATOR, a perſon who performs an operation: thus an operator in ſurgery and medicine, is one who operates or works with the hand on the human body, to preſerve or reſtore its health; hence a lithotomiſt is called an operator for the ſtone; a perſon who couches cataracts, &c. an operator for the eyes; and one who draws teeth, &c. an operator for the teeth.

OPHIDION, in ichthyology, a genus of the acanthopterygious claſs of fiſhes, the body of which is long, ſubcylindric, and has three fins; the branchioſtege-membrane contains ſeven bones, they are oblong, ſlender, and ſomewhat crooked, and are with great difficulty diſtinguiſhed, unleſs the fiſh have the ſkin firſt taken off. Of this genus there are two ſpecies, *viz.* the ophidion with four beards on the lower jaw, growing to the ſize of a large eel; and the ophidion without beards, growing to about a foot and a half long.

OPHIDION, is alſo the name whereby ſome authors call that ſpecies of the ſyngnathus, commonly termed the ſea-adder.

OPHIOGLOSSUM, in botany, the plant adder's tongue. See the article ADDER's *tongue*.

OPHIOMANCY, Ὀφιομαντεία, in antiquity, the art of making predictions from ſerpents. Thus Calchas, on ſeeing a ſerpent devour eight ſparrows with their dam, foretold the duration of the ſiege of Troy. And the ſeven quoils of a ſerpent that was ſeen on Anchiſes's tomb, were interpreted to mean the ſeven years that Æneas wandered from place to place before he arrived in Latium. Thus, Virgil, Æn. l. 5. v. 85.

Septem enim gyros, ſeptena volumina traxit.

OPHIORHIZA, in botany, a genus of the pentandria-monogynia claſs of plants, the calyx of which is a ſingle leafed, permanent perianthium, cut into five ſegments; the corolla conſiſts of a ſingle funnel-faſhioned petal; the fruit is a broad, obtuſe, bilobated capſule, containing a great many angular ſeeds.

OPHIOXYLON, in botany, a genus of the polygamia-monoecia claſs of plants, the calyx of which is a very ſmall perianthium, cut into five ſegments; the corolla conſiſts of a ſingle funnel-ſhaped petal, the fruit of the hermaphrodite is a didymous bilocular berry, in which is a ſingle roundiſh ſeed.

OPHITES, in natural hiſtory, a ſort of variegated marble, of a duſky-green ground, ſprinkled with ſpots of a lighter green, otherwiſe called ſerpentine. See the article MARBLE.

OPHITES, in church hiſtory, chriſtian heretics, ſo called both from the veneration they had for the ſerpent that tempted Eve, and the worſhip they paid to a real ſerpent: they pretended that the ſerpent was Jeſus Chriſt, and that he taught men the knowledge of good and evil: they diſtinguiſhed between Jeſus and Chriſt; Jeſus, they ſaid, was born of the virgin, but Chriſt came down from heaven to be united with him: Jeſus was crucified, but Chriſt had left him to return to heaven. They diſtinguiſhed the God of the Jews, whom they termed Jaldabaoth, from the ſupreme God: to the former they aſcribed the body, to the latter the

soul of men. They had a live-serpent which they kept in a kind of cage; at certain times they opened the cage door and called the serpent: the animal came out, and mounting upon the table, twined itself about some loaves of bread; this bread they broke and distributed it to the company, who all kissed the serpent: this they called their Eucharist.

OPHRIS, or OPHRYS, TWYBLADE, in botany, a genus of the gynandria-diandria class of plants, the flower of which consists of five oblong petals; and the fruit is an oval capsule, containing a multitude of dust-like seeds.

OPHTHALMIA, ὀφθαλμία, in medicine, an inflammation of the membranes which invest the eye; especially of the adnata, or albugineous coat. See EYE. The eyes are very much inflamed with great pain, tension, tumour, heat, and redness; and sometimes there is such a strong sensation of pricking in the eye, as if it was caused by a needle or thorn. The eyes at first are full of scalding tears, which are followed by a pituitous matter, sometimes small in quantity, and sometimes more plentiful: a sordes adheres to the greater angle of the eye; and when the disease is violent, the neighbouring parts will swell, even as far as the cheeks, with a strong pulsation of the adjacent arteries. The small blood-vessels are visible, which in health are not to be seen, and all the white of the eye becomes red. If, besides these external signs, there is an appearance of moths, dust, flies, &c. floating in the air, there is an inflammation of the retina, which Dr. Pitcairn calls the internal ophthalmia. See the article *Diseases of the* EYE.

As in all the diseases of the eyes, so especially in their inflammation, Hoffman directs the patient to abstain from all spirituous liquors, the smoke of tobacco, and sternutatories: he must likewise avoid smoky rooms, the vapours of onions and garlic, as also all vivid lights and glaring colours. The drink may be water alone, or a decoction of fennel-seeds, harts-horn and barley; the aliment must be light of digestion. Intemperance of all kinds renders persons liable to this disease; as also a keen north-wind, and looking earnestly at the fire, sun, or glaring colours; likewise metallic vapours, costiveness, and unusual refrigerations of the extreme parts, especially in menstruation. Sometimes it is owing to other diseases, as the small pox, measles, scurvy, and the driving back the gouty matter.

A slight ophthalmia is easily cured; a more severe one generally continues a month or longer, and often leaves a spot in the cornea, or depraves the humours of the eye.

Sydenham directs the patient to take away ten ounces of blood, and the next morning to give the common purging potion, which may be repeated twice more, with the interposition of two days between every dose; and at night an ounce of diacodium. On the days in which purging is omitted, let the patient take four ounces, three or four times in a day, of the emulsion of the four greater cold seeds, and white poppy seeds: externally, take plantane-water, red roses, and frog-spawn, of each one ounce, and prepared powder of tutty one dram; make a collyrium, and let a few drops be dropped in the eyes twice in a day, but not till after the first purge.

If the disease does not yield to repeated cathartics and bleeding, give an ounce of diacodium every night. In a strumous ophthalmia, calomel is the only remedy, according to Pitcairn. In the mean while he recommends the application of blisters to the neck, and after that setons, or issues at least. Hoffman, besides blisters, setons, &c. recommends cupping, with scarification in the nape of the neck and behind the ears; and in the violent sort of this disease, bleeding in the jugular; as also sinapisms of rocket-seeds boiled in wine, and then put into small bags, and applied to the nape of the neck or to the arm-pits: for inward use he recommends an infusion, in the manner of tea, of valerian-root, liquorice, elder flowers, and fennel-seed, drank plentifully; and before the drinking of it to receive the vapour or steam into the eyes: externally, Shaw recommends a dram of camphor to be dissolved in an ounce of french brandy, used as a collyrium. Junker says, if this composition makes the eye smart too much, blowing therein will soon take off the brandy, and leave all the camphor behind: but when there is a corroding acrimony, Hoffman recommends the mucilage of quince-seeds, with rose-water, with a very little saffron, to which if it is necessary a little opium may be added: and every evening temperate pediluvia may be used. In a chronical ophthalmia,

ophthalmia, where there is a continual dripping of a salt, sharp lympha, mix a scruple of white vitriol with two drams of unsalted butter, of which put as much as the size of a pea into the greater angle of the eye, repeating it now and then. Dr. Cheyne says Æthiop's mineral, taken in a large dose, twice a day, and continued a long time, never fails curing an inveterate ophthalmia.

OPHTHALMICS, medicines good in disorders of the eyes. See EYE.

OPHTHALMIC NERVES, the fifth pair of the head. See the article NERVES.

OPHTHALMOGRAPHIA, the description of the eye. See the article EYE.

OPHTHALMOSCOPY, a branch of physiognomy, which deduces the knowledge of a man's temper and manners from the appearance of his eyes.

OPIATES, medicines of a thicker consistence than a syrup, prepared with opium scarcely fluid. They consist of various ingredients, made up with honey or syrup; and are to be used for a long time either for purgative, alterative or corroborative intentions. Hence there are opiates of three kinds; that is, of a purgative, an alterative, and of a corroborating quality.

The word opiate is also used, in general, for any medicine given with an intention to procure sleep, whether in the form of electuaries, drops, or pills, of which kind is Matthew's pill; the best method of preparing which, according to Dr. James, is as follows: take of the extract of opium, of black hellebore, of liquorice, and the soap of tartar, each four ounces; let the hellebore and liquorice be made into a subtile powder; beat and mix these ingredients well together; then with two or three ounces of this mass, mix an ounce of english saffron cut into small pieces, and beat them together till the saffron is so perfectly mixed that no part of it is discernible from the rest; then beat and mix that with the rest of the mass. If this mass be too dry, mix it with as much rectified oil of turpentine as is sufficient to make it into a mass fit to form into pills. Then put it into a gally-pot, over which tie a bladder or piece of leather, and set it by for use. For the effects of opiates, see the article OPIUM.

OPINION, is defined to be an assent of the mind to propositions not evidently true at first sight.

Probable arguments beget opinion, as demonstration does science. See PROBABILITY and DEMONSTRATION.

OPISTHOTONOS, in medicine, a kind of convulsion, wherein the body is bent backwards. See CONVULSION.

OPIUM, in the materia medica, is an inspissated juice, partly of the resinous, and partly of the gummy kind, brought to us in cakes from eight ounces to a pound weight. It is very heavy, of a dense texture, and not perfectly dry; but, in general, easily receives an impression from the finger: its colour is a brownish yellow, so very dark and dusky that at first sight it appears black: it has a dead and faint smell, and its taste is very bitter and acrid. It is to be chosen moderately firm, and not too soft; its smell and taste should be very strong, and care is to be taken that there is no dirty or stony matter in it.

Opium is the juice of the papaver album, or white poppy, with which the fields of Asia Minor are in many places sown, as ours are with corn. When the heads are near ripening, they wound them with an instrument that has five edges, which on being stuck into the head makes at once five long cuts in it; and from these wounds the opium flows, and is next day taken off by a person who goes round the field, and put up in a vessel which he carries fastened to his girdle: at the same time that this opium is collected, the opposite side of the poppy head is wounded, and the opium collected from it the next day. They distinguish, however, the produce of the first wounds from that of the succeeding ones; for the first juice afforded by the plant is greatly superior to what is obtained afterwards. After they have collected the opium, they moisten it with a small quantity of water or honey, and work it a long time upon a flat, hard, and smooth board, with a thick and strong instrument of the same wood, till it becomes of the consistence of pitch; and then work it up with their hands, and form it into cakes or rolls for sale.

Opium, on importation, pays a duty of 1 s. 11 $\frac{1}{4}$ d. the lb. and draws back, on exportation, 1 s. 8$\frac{49}{100}$d.

Opium at present is in great esteem, and is one of the most valuable of all the simple medicines: applied externally it is emollient, relaxing and discutient, and greatly promotes suppuration; if long kept upon the skin it takes off the hair, and always occasions an itching in it; sometimes

ſometimes it exulcerates it, and raiſes little bliſters if applied to a tender part. Laid on the perinæum it promotes venereal inclinations; and ſometimes on external application, it allays pain, and even occaſions ſleep: but it muſt by no means be applied to the head, eſpecially to the ſutures of the ſkull, for it has been known to have the moſt terrible effects in this application, and even to bring on death itſelf. Opium, taken internally, removes melancholy, eaſes pain, and diſpoſes to ſleep; in many caſes removes hæmorrhages, provokes ſweating, and is a provocation to venery; and in general has a greater effect on women and children than on men. A moderate doſe is commonly under a grain, though according to the circumſtances two grains, or even three may be within the limits of this denomination; but cuſtom will make people bear a dram or more, tho' in this caſe nature is vitiated, and nothing is to be hence judged in regard to others. If given diſſolved, it operates in half an hour; if in a ſolid form, as in pills, or the like, it is ſometimes an hour and a half. Its firſt effect, in this caſe, is the making the patient cheerful, as if he had drank moderately of wine, and at the ſame time bold and above the fear of danger; for which reaſon the Turks always take it, when they are going to battle. A very immoderate doſe brings on a ſort of drunkenneſs, much like that occaſioned by an immoderate quantity of ſtrong liquors; cheerfulneſs and loud laughter at firſt, than a relaxation of the limbs, a loſs of memory, and lightheadedneſs; then vertigoes, dimneſs of the eyes, with a laxity of the cornea and a dilatation of the pupils, a ſlowneſs of the pulſe, redneſs of the face, relaxation of the under jaws, ſwelling of the lips, difficulty of breathing, painful erection of the penis, convulſions, cold ſweats, and finally death. Thoſe who eſcape are uſually relieved by a great number of ſtools, or profuſe ſweats. People who have gradually accuſtomed themſelves to an immoderate uſe of opium, are ſubject to relaxations and weakneſſes of all the parts of the body: they are apt to be faint, idle and thoughtleſs; and are generally in a ſtupid and uncomfortable ſtate, except juſt after they have taken a freſh doſe: in ſhort, they loſe their appetite, and grow old before their time.

Prepared opium, commonly called extract of opium, is made by diſſolving opium in a ſufficient quantity of water with a gentle heat; then ſtraining the ſolution from the fæces, and evaporating it to the conſiſtence of honey. Tincture of opium, or liquid laudanum, otherwiſe called the thebaic tincture, is made as follows: take of prepared opium two ounces; of cinnamon and cloves, each one drachm: of white-wine, one pint: infuſe them a week without heat, and then filtre it through paper. Quincy obſerves of this preparation, that the addition of the ſpices are of no uſe.

OPOBALSAMUM, in the materia medica, the ſame with the true balſam. See the article BALSAM.

OPOPANAX, in the materia medica, is a gum-reſin of a tolerably firm texture, uſually brought to us in looſe granules or drops, and ſometimes in large maſſes, formed of a number of theſe, connected by a quantity of matter of the ſame kind; but theſe are uſually loaded with extraneous matter, and are greatly inferior to the pure looſe kind. The drops or granules of the fine opopanax, are on the outſide of a browniſh-red colour, and of a duſky-yellowiſh or whitiſh colour within: they are of a ſomewhat unctuous appearance, ſmooth on the ſurface; and are to be choſen in clear pieces, of a ſtrong ſmell, and acrid taſte.

On importation, opopanax pays a duty of 1 s. $3\frac{1}{2}$ d. per pound; and draws back, on exportation, 1 s. $1\frac{60}{100}$d.

Opopanax is attenuating and diſcutient, and is gently purgative; it diſpels flatulencies, and is good in aſthmas, in inveterate coughs, and in diſorders of the head and nerves. It alſo promotes the menſes, and is good againſt all obſtructions of the viſcera.

OPOSSUM, in zoology, a ſpecies of didelphis, with the paps within the abdomen. See the article DIDELPHIS.

The opoſſum is a very ſingular animal, about fifteen inches long from the extremity of the noſe of the rump; and its tail is equal in length to the whole body: the legs are robuſt, and the feet armed with ſharp, long and crooked claws. But what is moſt ſingular in this animal, is, that the ſkin of the belly of the female is looſe, forming a kind of pouch or bag, with an aperture in it, at which, in time of danger, it takes in its young. See plate CLXXXVIII. fig. 6.

OPPILATION, in medicine, the act of obſtructing or ſtopping up the paſſages of

of the body, by redundant or peccant humours. This word is chiefly ufed for obftructions in the lower belly.

OPPILATIVES, the fame with deobftruent medicines. See DEOBSTRUENTS.

OPPELEN, a city of the kingdom of Bohemia, in the duchy of Silefia: eaft long. 17° 23′, north lat. 50° 45′.

OPPENHEIM, a town of Germany, in the palatinate of the Rhine.

OPPONENT, a perfon who withftands or oppofes another.

This term is chiefly ufed in fcholaftic or academic difputes or exercifes, where a perfon who oppofes a thefis, or impugns it by his objections, is called opponent.

OPPOSITES, *oppofita*, among logicians, fimply taken, are fuch things as differ among themfelves, but fo as not to differ in like manner from fome third. The fchoolmen reckon four kinds of oppofites, *viz.* relatively, contrarily, privatively, and contradictorily oppofites.

Oppofites complexly taken, are propofitions that clafh with each other, as man is an animal, and man is not an animal.

OPPOSITE ANGLES. See ANGLE.

OPPOSITE CONES. See CONE.

OPPOSITE SECTIONS, are two hyperbolas made by cutting two oppofite cones by the fame plane. See the articles HYPERBOLA and CONIC SECTIONS.

OPPOSITION, in logic, the difagreement between propofitions, which have the fame fubject and the fame predicate. See the article PROPOSITION.

OPPOSITION, in aftronomy, is that afpect or fituation of two ftars or planets, wherein they are diametrically oppofite to each other, or 180° afunder. See PLANET, ORBIT, SYZYGY, &c.

OPPOSITION, in geometry, the relation of two things, between which a line may be drawn perpendicular to both.

OPPOSITION, in rhetoric, a figure whereby two things are joined, which feem incompatible; as *a wife folly*.

OPTATIVE MOOD, in grammar, that which ferves to exprefs an ardent defire or wifh for fomething. See MOOD.

In moft languages, except the Greek, the optative is only expreffed by prefixing to the fubjunctive an adverb of wifhing, as *utinam*, in latin; *plut a Dieu*, in french, and *would to God*, in englifh; but in greek, it is expreffed by a peculiar inflection, ειμι, εις, οι, &c.

OPTERIA, in antiquity, prefents made by a bridegroom to his bride, when firft conducted to him. See BRIDE, &c.

OPTICS, *optica*, taken properly and fimply, is that fcience which teaches the properties of direct vifion; but in a larger fenfe, it may comprehend the whole doctrine of light and colours, and all the phænomena of vifible objects. In this large fenfe, the incomparable Sir Ifaac Newton calls his book of light and colours, optics; or it is a mathematical fcience that treats of light in general, and of every thing that is feen with direct rays; and explains the feveral properties and effects of vifion in general, and properly of that which is direct and ordinary. For when the rays of light are confidered as reflected, the fcience which teaches their laws and properties, is called catoptrics; and when the refraction of rays is confidered, and the laws and nature of it explained and demonftrated, the fcience is called dioptrics. So that optics comprehends the whole, of which catoptrics and dioptrics are the two parts.

Optics makes likewife a confiderable branch of natural philofophy, both as it explains the laws of nature, according to which vifion is performed; and as it accounts for abundance of phyfical phænomena, otherwife inexplicable. For what can be determined about light, colours, tranfparency, opacity, meteors, the rainbow, parhelia, &c. but on principles of optics? What about the nature of the ftars? The ftructure of the mundane fyftem? The motion of the planets? The eclipfes of the luminaries, &c. Hence optics makes alfo a confiderable part of aftronomy. The beft writers on this fubject are Sir Ifaac Newton and Dr. Smith.

OPTICAL PLACE. See PLACE.

OPTIMATES, in roman antiquity, were, according to Tully, the beft citizens, who defired their actions might be approved of by the better fort; and the populares, thofe, who out of a thirft of vainglory, did not confider fo much what was right, as what would pleafe the populace.

Others will have the optimates to have been thofe perfons of whatever rank, who ftood up for the dignity of the chief magiftrates, and who cared not if the inferior members of the common-wealth fuffered for the advancement of the commanding powers: whereas the populares were thofe who courted the favour of the commons,

commons, by encouraging them to sue for greater privileges.

OPUNTIA, INDIAN-FIG, in botany, a species of cactus, distinguished by being ramose and dichotomous. See the article CACTUS.

It is on this plant that the cochineal animal feeds. See COCHINEAL.

OR, in heraldry, denotes yellow, or gold-colour. See COLOUR and METAL.

In the coats of noblemen, it is blazoned topaz; and in those of sovereign princes, sol.

It is represented in engraving by small points or dots, scattered all over the field or bearing. See pl. CLXXXVIII. fig. 3.

ORACLE, among the heathens, was the answer which the gods were supposed to give to those who consulted them upon any affair of importance; it is also used for the god who it was thought gave the answer, and the place where it was given.

The credit of oracles was so great, that in all doubts and disputes their determinations were held sacred and inviolable: whence vast numbers flocked to them for advice about the management of their affairs; and no business of any consequence was undertaken, scarce any peace concluded, any war waged, or any new form of government instituted, without the advice and approbation of some oracle. The answers were usually given by the intervention of the priest or priestess of the god who was consulted, and generally expressed in such dark and intermediate phrases, as might be easily wrested to prove the truth of the oracle whatever was the event. It is not, therefore, to be wondered at, that the priests who delivered them were in the highest credit and esteem; and that they improved this reputation greatly to their advantage. They accordingly allowed no man to consult the gods, before he had offered costly sacrifices, and made rich presents to them. And to keep up the veneration for their oracles, and to prevent their being taken unprepared, they admitted persons to consult the gods only at certain stated times; and sometimes they were so cautious, that the greatest persons could obtain no answer at all. Thus Alexander himself was peremptorily denied by the pythia, or priestess of Apollo, till she was, by downright force, obliged to ascend the tripos; when, being unable to resist any longer, she cried out, *thou art invincible*; and these words were accepted instead of a farther oracle.

The principal oracles of antiquity were, 1. The oracle of Dodona, where there was a temple consecrated to Jupiter: the priests who delivered these oracles were called selli; but in latter ages they were pronounced by three old women. Near the temple of Dodana was a sacred grove of oaks, which were said to be endued with a human voice, and a prophetical spirit; the reason of which fiction seems to have been, that the priests often concealed themselves within the hollow of these trees, and from thence delivered oracles. 2. The oracle of olympian Jupiter at Elis. 3. The oracle of Apollo at Delphi, where it was pretended that an inspiring vapour arose from the mouth of a deep cavern, on which the pythia being placed on a three legged stool, received the divine afflatus, and became inspired: this oracle was the most famous of all others. 4. The oracle of Trophonius, at Lebadea, a city in Bœotia, at which, after a number of ceremonies were performed, the votary descended into Trophonius's cave, where future events were revealed to him in a very extraordinary manner. It is remarkable, that all who consulted this oracle, seemed to be frighted out of their senses; for some time after, they became pensive and melancholy, their tempers were soured, and their countenances, however gay and pleasant before, were rendered dull and heavy. 5. The oracle of Amphiaraus, the answers of which were delivered in dreams, while the person slept on the skin of the victim he had sacrificed. 6. That of Mercury, at Pharæ, a city of Achaia, where those who wanted information, after offering frankincense upon the altar, and presenting a piece of money, placed their ear to the statue, and then stopping both ears till they were at some distance, took away their hands, and received the first voice they heard as a divine oracle. 7. The oracle of Hercules at Bura, where was a cave in which was placed the statue of Hercules: here they who consulted the god first addressed themselves to him by prayer; then taking four dice out of a great heap that lay ready, they threw them upon the table, and as all the dice had particular marks, they were interpreted, and the answer given by consulting a book kept for that purpose. 8. At Patræ, a city on the sea-coast of Achaia, was a temple of Ceres,

before

before which was a fountain which delivered oracles only on the event of diseases, by letting down a looking-glass so low, that the bottom might just touch the surface of the water; when from the various figures represented in it, conjectures were formed concerning the patient. Besides these, there were several others, as that of Æsculapius at Epidaurus, that of Bacchus at Amphiclea, that of Orpheus's head, at Lesbos, &c.

ORACH, *atriplex*, in botany. See the article ATRIPLEX.

ORAL, something delivered by word of mouth, without being committed to writing; in which sense we say, oral law, oral tradition, &c.

ORAN, a city and port-town of Barbary, under the meridian of London: north lat. 36° 30'.

ORANGE-TREE, *aurantium*, in botany, See the article AURANTIUM.

Orange-flowers are justly esteemed one of the finest perfumes; and though little used in medicine, yet the water distilled from them is accounted stomachic, cordial and carminative. The fruit is cooling and good in feverish disorders, and particularly in diarrhœas. Orange-peel is an agreeable aromatic, proper to repair and strengthen the stomach, and give a very grateful flavour to any infusions or tinctures, into whose compositions they enter. Oranges and lemons pay, on importation, a duty of 3 s. $10\frac{20}{100}$ d. the thousand; and draw back, on exportation, 3 s. $4\frac{1}{2}$ d.

ORANGE-COLOUR, among dyers, one that partakes equally of red and yellow. See the articles COLOUR and DYEING.

ORANGE, in geography, a city of Provence, in France, capital of the principality of Orange: it is situated on the east side of the river Rhone, seventeen miles north of Avignon: east long. 4° 46', north lat. 44° 10'.

ORANGEADE, a drink made of orange-juice, water, and sugar, said to be good in fevers.

ORANGERY, in gardening, a gallery exposed to the south, but well closed with glass-windows, to preserve orange-trees in winter.

It likewise denotes the parterre, where the orange-trees are exposed in kindly weather.

ORATION, in rhetoric, a speech or harangue, composed according to the rules of oratory, and spoke in public.

Orations may be all reduced to three kinds, *viz.* the demonstrative, deliberative, and judicial. To the demonstrative kind belong panegyrics, genethliaca, epithalamia, congratulations, &c. To the deliberative kind belong persuasion, exhortation, &c. And to the judicial kind belong accusation, confutation, &c. See PANEGYRIC, GENETHLIACUM, &c.

Funeral ORATION. See FUNERAL.

ORATORIO, in the italian music, a sort of sacred drama of dialogues; containing recitativos, duettos, trios, ritornellos, choruses, &c.

The subjects of these pieces are usually taken from the scriptures, or from the life of some saint, &c.

The music for the oratorio should be in the finest taste, and best chosen strains. These oratorios are greatly used at Rome, in time of lent; and, of late, in England.

ORATORY, *oratoria*, the art of speaking well, otherwise called rhetoric. See the article RHETORIC.

ORATORY, among the romanists, a closet or like apartment near a bed-chamber, furnished with an altar, crucifix, &c. for private devotion.

There are two congregations of religious, one in Italy, the other in France, which are called priests of the oratory; but it ought to be observed, that the members are not, properly speaking, religious, being obliged to make no vows, and their institute being purely ecclesiastical.

ORB, *orbis*, in astronomy, &c. denotes an hollow globe or sphere. See the articles GLOBE and SPHERE.

ORBICULARE os, in anatomy, a little bone of the ear, so called from its figure. See the article EAR.

ORBICULARIS, in anatomy, an appellation given to the constrictor-muscle of the lips; as also to the constrictor of the upper eye-lid, which is single, and rises from the upper apophysis of the maxillary bone, near the larger canthus of the eye, and surrounds the eye-lid with a series of orbicular fibres, serving to shut it; and, in this action, it also depresses and draws forward the eye brow, and elevates the lower eye-lid.

Some also give the name of orbicularis intestini to the sphincter of the anus.

ORBIS, the GLOBE-FISH, a name given to two species of ostracion, nearly as broad as long, and covered with spines. See the article OSTRACION.

ORBIS MAGNUS, in astronomy, denotes the earth's orbit, in its annual revolution round the sun.

ORBIT, *orbita*, in aſtronomy, the path of a planet or comet, or the curve that it deſcribes in its revolution round its central body: thus the earth's orbit is the curve which it deſcribes in its annual courſe, and uſually called the ecliptic. See the article ECLIPTIC.

The orbits of all the planets are ellipſes having the ſun in their common focus; in which curve they move according to the invariable law mentioned below.

However, the orbit of the earth is conſiderably disfigured by the action of the moon; as is alſo the orbit of ſaturn by the action of jupiter, when they happen to be in conjunction.

Though the orbits of the planets be elliptical, not circular, yet that they are very little ſo, even in the moſt excentric orbit, as that of mercury, will appear by comparing their excentricities with their mean diſtances from the ſun. Thus, ſuppoſe the mean diſtance of the earth from the ſun be divided into 1000 equal parts, then in thoſe parts we have, in

Merc. CS:DS:: 80: 387:: 1:4,84
Venus, CS:DS:: 5: 723:: 1:144,6
Earth, CS:DS:: 17: 1000:: 1:19
Mars, CS:DS:: 141: 1524:: 1: 10,8
Jupiter, CS:DS:: 250: 5201:: 1: 20,8
Saturn, CS:DS:: 547: 9538:: 1: 17,4

It is found by experience, that the orbits of the planets are quieſcent, or that the line of the apſides AP (plate CLXXXIX. fig. 1. n° 1.) always keep one and the ſame poſition with reſpect to the fixed ſtars: and the aphelium, or point A, poſſeſſes different points in the ecliptic in the ſeveral orbits, as in the foregoing ſynopſis.

That the earth's orbit is elliptical, is well known from common experience; for were the orbit circular, the ſun's apparent diameter would always be the ſame; but we find it is not, for if it be meaſured with a micrometer in winter-time, it will be found conſiderably larger than in the ſummer, and it will be greateſt of all when the ſun is in the 8° of ♑ (which ſhews that is the place of the aphelium) it being then 32′ 47″; whereas, when the ſun is in the 8° of ♋, his diameter is but 31′ 40″.

Hence it is evident that the ſun is really nearer to us in the midſt of winter than in the midſt of ſummer; but this ſeems a paradox to many, who think the ſun muſt needs be hotteſt when it is neareſt to us, and that the ſun is apparently more diſtant from us in December than in June. As to the ſun's being hotter, it is true, it is ſo to all thoſe places which receive his rays directly or perpendicularly; but we find his heat abated on account of the obliquity of the rays, and his ſhort continuance above the horizon at that time. And, as to his diſtance, it is only with reſpect to the zenith of the place, not the center of the earth; ſince it is plain the ſun may approach the center of the earth, at the ſame time that it recedes from the zenith of any place.

Agreeably to the ſun's nearer diſtance in the winter, we obſerve his apparent motion is then quicker than in ſummer; for in the 8° of ♑ it is about 61′ per day, but in 8° of ♋ his motion is but 57′ per day. Accordingly, we find the ſummer half-year eight days longer than the winter half-year, as appears by the following computation, according to the new ſtyle.

Summer half year includes in		Winter half-year includes in	
March	10½ days	Sept.	7 days.
April	30	Oct.	31
May	31	Nov.	30
June	30	Dec.	31
July	31	Jan.	31
Auguſt	31	Feb.	28
Sept.	23	Mar.	20½
Sum. half.	186½		178½
Wint. half.	178½		

The difference 8 days.

For the ſun's attracting force being one part of the cauſe of the planet's motion, and this force always increaſing and decreaſing in the inverſe ratio of the ſquares of the diſtances, it is evident the velocity of the planet will always be greater the nearer it is to the ſun, and *vice verſa*. Hence the motion of a planet is every where unequable, being conſtantly accelerated as it paſſes from A by D to P; and in the other half, from P to A, it is retarded.

Yet is this unequal motion of a planet regulated by a certain immutable law, from which it never varies; which is, that a line, drawn from the center of the ſun to the center of the planet, does ſo move with the planet about the ſun, that it deſcribes elliptic area's always proportional to the times. That is, if when the planet moves ſloweſt, it deſcribes the arch A *d* in a given time; and when it moves quickeſt, it deſcribes the arch *b* P in the ſame time; then will the trilineal area AS*d* be equal to the other trilineal area *b* SP. To demonſtrate this, let the time in which

which the planet moves through the periphery of its orbit to be divided into equal parts, and suppose that in the first part it described any right line A B (*ibid.* n° 2.) by the projectile force in any direction, and the centripetal force conjointly; then in the second part of time it would proceed in the same right line to *c*, if nothing prevented; so that B*c* = A B, as is manifest from the first law of motion. Draw the right lines S B, S*c*, and the triangles A B S and B*c* S will be equal, as having equal bases A B, B *c*, and the same altitude of the vertex S. But when the body comes to B, let the centripetal force act with a new impulse either equal to the former or unequal, and let it cause the body to decline from the right line B*c*, and describe the right-line B C; draw C *c* parallel to B S, meeting B C in C; and at the end of the second part of time the body will be at C, and in the same plane with the triangle A S B. Join S C, and because of the parallels S B and C *c*, the triangle S B C will be equal to the triangle S B*c*, and therefore equal to the triangle S A B. By the same way of reasoning, if the centripetal force act successively in the points C, D, E, causing the body in each equal part of time to describe the right lines C D, D E, E F, &c. the triangles S C D, S D E, S E F, &c. will be equal, and all in the same plane.

In equal times, therefore, equal area's are described; and, by composition of ratio's, any sums of area's S A D S, S A F S, are to each other as the times in which they are described. Let now the number of triangles be increased, and their breadth be diminished in infinitum; then will their perimeter A D F be ultimately a curve: and, therefore, the centripetal force, by which the body is drawn perpetually from the tangent to this curve, acts incessantly; and the area's described are also in this case proportional to the times of their description. Hence the velocity of the revolving body or planet is every where inversely, as the perpendicular let fall from the center S to the tangent of the orbit in the place of the planet. For the velocities in the points A, B, C, &c. are as the bases of the triangles A B, B C, C D, &c. as being the spaces described in the same time; and the bases of equal triangles are reciprocally as their perpendicular altitudes; and, therefore, since in the evanescent triangles A S B, A S C, &c. the right lines A *c*, B *d*, C *e*, &c. become tangents to the curve in the points A, B, C, &c. it is manifest the velocity in these points will be inversely, as a perpendicular from S let fall upon those tangent-lines produced.

Hence also it follows, that the times in which equal arches are described in any planetary orbits are directly as those perpendiculars, because they are inversely as the velocities.

ORBITELLO, a city and port-town of Italy, in the dutchy of Tuscany, situated on a bay of the Mediterranean: east long. 12°, north lat. 42° 30′.

ORCADES, the ORKNEY-ISLANDS. See the article ORKNEY.

ORCELLE, or CANARY-WEED, in botany, a species of cladonia. See the article CLADONIA.

ORCHARD, a plantation of fruit-trees. In planting an orchard, great care should be taken that the soil is suitable to the trees planted in it; and that they are procured from a soil nearly of the same kind, or rather poorer than that laid out for an orchard. As to the situation, an easy rising ground, open to the south-east, is to be preferred. Mr. Miller recommends planting the trees fourscore feet asunder, but not in regular rows; and would have the ground between the trees plowed, and sown with wheat and other crops, in the same manner as if it was clear from trees, by which means the trees will be more vigorous and healthy, will abide much longer and produce better fruit. If the ground has been pasture, the greensward should be plowed in the spring before the trees are planted; and if it be suffered to lie a summer fallow, it will greatly mend it, provided it be stirred two or three times to rot the grass, and prevent the growing of weeds. At Michaelmas it should be plowed pretty deep, in order to make it loose for the roots of the trees, which if the soil be dry, should be planted in October; but if it be moist, the beginning of March will be a better season. If several sorts of fruit-trees are to be planted on the same spot, you should observe to plant the largest growing trees backwards, and so proceed to those of less growth, continuing the same method quite through the whole plantation; by which means the sun and air will more easily pass through the whole orchard. When you have planted the trees, you should support

port them with ftakes, to prevent their being blown out of the ground by the wind; and the following fpring, if the feafon fhould prove dry, cut a quantity of green turf, and lay it about the roots, with the grafs downwards; by which means a great expence of watering will be faved; and after the firft year they will be out of danger. Whenever you plow the ground betwixt thefe trees, you muft be careful not to go too deep amongft their roots, which would greatly damage the trees; but if you do it cautioufly, your ftirring the face of the ground will be of great fervice to them: though you fhould obferve, never to fow too near the tree, nor fuffer any great rooting weeds to grow about them; becaufe this would ftarve them, by exhaufting the goodnefs of the foil, which every two or three years fhould be mended with dung or other manure, that will be abfolutely neceffary for the crops fown between. Thefe trees, after they are planted out, will require no other pruning befides cutting off their bad branches, or fuch as crofs each other.

ORCHESTRA, in the antient theatres, a place in the form of a femi-circle, where the dancing was performed.

In the greek theatres, the orcheftra made part of the ftage; but, among the Romans, it anfwered nearly to our pit; only that, in it were difpofed the feats for the fenators, magiftrates, veftals, and other perfons of diftinction.

ORCHIES, a town of the French Netherlands, in the province of Flanders, twelve miles fouth-eaft of Lifle.

ORCHILLA, one of the Leeward-iflands.

ORCHIS, FOOL'S-STONES, in botany, a genus of the gynandria-diandria clafs of plants, the corolla of which is of a corniculated form; and its fruit is an oblong unilocular capfule, containing numerous fcobiform feeds.

Orchis root abounds with a glutinous juice, good for blunting acrid ferous humours: it is alfo accounted an aphrodifiac, but on no good foundation.

ORDEAL, a form of trial, or of difcovering innocence or guilt, formerly practifed over almoft all Europe, and which prevailed in England from the time of Edward the Confeffor, till it was abolifhed by a declaration of Henry III. It was called purgatio vulgaris, or judicium, in oppofition to bellum or combat, the other form of purgation; and was of various kinds, as that of fire, that of red hot iron, that of water, that of judicial pottage, that of hallowed cheefe, that of the green crofs, and that of dice laid on relics covered with a woollen cloth. To each of which kinds particular maffes were appointed.

In England, an offender, on being arraigned and pleading not guilty, had it in his choice to put himfelf upon God and his country; that is, upon the verdict of a jury; or upon God alone, on which account it was called the judgment of God, it being prefumed that God would deliver the innocent. The more popular kinds of ordeal were thofe of red-hot iron and water; the firft for freemen and people of fafhion, and the laft for peafants. That by fire, as practifed here, was the perfon's walking barefooted and blindfold over nine red-hot plough-fhares; and if he efcaped unhurt, he was acquitted, otherwife condemned. That of water was of two kinds, *viz.* either with hot water or cold; the former was where the perfon fufpected put his arm or leg into fcalding water, and brought it out unhurt; and the latter was when his body was not, contrary to the courfe of nature, borne up by the water.

ORDER, in architecture, is a fyftem of the feveral members, ornaments and proportions of columns and pilafters; or a regular arrangement of the projecting parts of a building, efpecially the column, fo as to form one beautiful whole.

M. Le Clerk defines an order to be a column charged with an entablature, and fupported on a pedeftal.

The origin of orders may be faid to be almoft as antient as human fociety. The rigour of the feafons firft put men upon making little cabbins to retire into: at the firft they were made half under ground, and half above, and were covered with ftubble; but, in time growing more expert, they placed trunks of trees on end, and laid others a-crofs, to bear up the covering. See the article ARCHITECTURE.

From hence they took the hint of more regular architecture, the trunks of trees upright reprefenting columns; and the girds or bands which ferved to keep the trunks from burfting, expreffed bafes and capitals; and the fummers which lay a-crofs, gave the hint of entablatures; and likewife, the coverings, ending in points, gave a notion of pediments. This

hypothesis we have from Vitruvius, and it has been well illustrated by M. Blondel. See the article COLUMN, &c.

Others are of the opinion that columns take their rise from the pyramids which were erected by the antients over tombs; and that the urns wherein their ashes were inclosed, represented the capitals, the abacus of which was a brick laid over to cover the urn: but Vitruvius's account seems the most natural. See the article ABACUS, &c.

In time, the height of columns, was regulated by the Greeks on the foot of the proportion of a human body. The doric represented a man of a strong robust make, the ionic that of a woman, and the corinthian that of a girl; their bases and capitals were their shoes, head dress, &c. The three Greek orders represent three different manners of building, *viz.* the solid, mean, and delicate; the two Italian ones are imperfect productions of these.

The little regard the Romans had for the last, appears from this, that we meet not with one instance in the antique where they are intermixed.

Daviler observes, that the abuse the moderns have introduced by the mixture of the greek and latin orders, arises from their want of reflection on the use which the antients made thereof.

To give a general idea of the orders, it will be necessary to observe that the whole is composed of two parts, at least, *viz.* the column and the entablature; and of four parts, at the most, where there is a pedestal under the columns, and one acroter or little pedestal on the top of the entablature.

That the column has three parts, *viz.* the base, the shaft, and the capital; the entablature has three likewise, *viz.* the architrave, the frieze, and the corniche; which parts are all different in the several orders, having each their particular characters and members called by the general names of mouldings or ornaments. See the article BASE, &c.

These orders took their names from the people among whom they were invented. Scammozzi calls the tuscan, the gigantic; the doric, the herculean; the ionic, the matronal; the composite, the heroic; and the corinthian, the virginal.

An order of columns is usually understood of a column bearing its entablature; but the order is scarcely complete, except the column be raised on a pedestal. The pedestal, column, and entablature are three compound parts, each consisting of three others, as has been said before. The antients have given us five several orders of columns, the tuscan, doric, ionic, composite, and corinthian. See the articles TUSCAN, DORIC, &c.

Disposition of the ORDERS. These ought to be so disposed in building, that the most solid may be placed undermost; as being the most proper to sustain the weight, and to give the whole edifice a more firm foundation: therefore the doric must always be placed under the ionic, the ionic under the corinthian, and the corinthian under the composite. As to the tuscan, being a plain rude order, it is seldom used above ground, except in villas, where one order only is employed. In very large buildings, as amphitheatres, where many orders are required, the tuscan may be placed under the ionic instead of the doric. But if you are desirous to leave out any of these orders, as for instance, to place the corinthian immediately over the doric, you may, provided you always observe to place the most strong and solid undermost, for the reasons above-mentioned.

As to the proportions, any height being given, divide it into ten equal parts, called diameters, or the thickness of the shaft at the bottom, for the tuscan order; the pedestal having two, the column seven, and the entablature one and three quarters. The doric order contains twelve such parts or diameters, and one third; the ionic, thirteen and an half; the corinthian, fourteen and an half; and the composite fifteen and a third such parts, which are distributed as expressed in the figure of each. See the articles TUSCAN, DORIC, &c.

Intercolumniation of the ORDERS. See the article INTERCOLUMNIATION.

But besides these regular orders, there are others to be met with; as the attic, gothic, persian, rustic, &c. See the articles ATTIC, GOTHIC, &c.

ORDER is also used for a division or class of any thing: thus, the tribe of animals called birds, is subdivided into six orders. See the article ORNITHOLOGY.

Holy ORDERS, a character peculiar to ecclesiastics, whereby they are set apart for the ministry. See ORDINATION.

Military ORDERS, are companies of knights, instituted by kings and princes; either

for

for defence of the faith, or to confer marks of honour, and make diſtinctions among their ſubjects.

Religious ORDERS, are congregations or ſocieties of monaſtics, living under the ſame ſuperior, in the ſame manner, and wearing the ſame habit.

ORDERS of curves, in geometry. See the article CURVE.

ORDINAL, *ordinale*, a book containing the order, or manner of performing divine ſervice. See RITUAL.

ORDINAL NUMBERS. See NUMBER.

ORDINANCE, or ORDONNANCE, a law, ſtatute, or command of a ſovereign, or ſuperior: thus the acts of parliament are ſometimes termed ordinances of parliament.

ORDINARII, in antiquity, a ſort of gladiators. See GLADIATORS.

ORDINARY, in general, ſignifies, common, uſual; thus, an embaſſador or envoy in ordinary, is one ſent to reſide ſtatedly, and for a number of years, in the court of ſome foreign prince or ſtate, in order to keep up a good underſtanding, and watch over the intereſt of his own nation.

This term is alſo applied to ſeveral officers in the king's houſhold, who attend on common occaſions. Thus we ſay, phyſician in ordinary, *&c.*

ORDINARY, in civil law, is any judge inveſted with authority to take cognizance of cauſes in his own right, and not by deputation.

ORDINARY, in common and canon law, is one who has ordinary or immediate juriſdiction in eccleſiaſtical cauſes in ſuch a place. In which ſenſe archdeacons are ordinaries, tho' the appellation is more frequently given to the biſhop of the dioceſe, who has the ordinary eccleſiaſtical juriſdiction. The archbiſhop is the ordinary of the whole province, to viſit and receive appeals from inferior judicatures. The romiſh canoniſts call the pope ordinary of ordinaries, ſince by the lateran council he has uſurped the right of collating by prevention to all benefices, in excluſion of the ordinary collators.

ORDINARY *of aſſiſe and ſeſſions*, was a deputy of the biſhop of the dioceſe, antiently appointed to perform divine ſervice for malefactors, and aſſiſt in preparing them for death.

ORDINARY *of Newgate*, a clergyman, who attends in ordinary upon the malefactors in that priſon, preaches and reads prayers in the chapel to all the priſoners, and attends and prays with the condemned malefactors at the place of execution.

ORDINARY, or *honourable* ORDINARY, in heraldry, a denomination given to certain charges properly belonging to that art. The honourable ordinaries are ten in number; *viz.* the chief, pale, bend, feſſe, bar, croſs, ſaltier, chevron, bordure, and orle. For which ſee the articles CHIEF, PALE, *&c.*

ORDINATES, or ORDINATE APPLICATES, in geometry, are parallel lines, MM, *mm*, (plate CLXXXVIII. fig. 4.) terminating in a curve, and biſſected by a diameter, as AD. The half of theſe, as MP, *mp*, is properly the ſemi-ordinate, though commonly called ordinate. See the articles CURVE, PARABOLA, HYPERBOLA, *&c.*

ORDINATION, the act of conferring holy orders, or of initiating a perſon into the prieſthood by prayer, and the laying on of hands. Ordination has always been eſteemed the principal prerogative of biſhops, and they ſtill retain the function as a mark of ſpiritual ſovereignty in their dioceſe. Without ordination, no perſon can receive any benefice, parſonage, vicarage, *&c.* A clerk muſt be twenty-three years of age before he can have any ſhare in the miniſtry; and twenty-four, before he can be ordained, and by that means be permitted to adminiſter the ſacraments. A biſhop, on the ordination of clergymen, is to examine them in the preſence of the miniſters who aſſiſt him at the impoſition of hands; and in caſe any crime, as drunkenneſs, perjury, forgery, *&c.* be alledged againſt any one that is to be ordained, either prieſt or deacon, the biſhop ought to deſiſt from ordaining him. The perſon to be ordained is to bring a teſtimonial of his life and doctrine to the biſhop, and give an account of his faith in latin, and both prieſts and deacons are obliged to ſubſcribe the thirty-nine articles.

The ordination days in the church of England, are the four Sundays immediately following the Ember-weeks, *viz.* the firſt Sunday in Lent, Trinity-Sunday, and the Sundays following the firſt Wedneſday after Sept. 14. and Dec. 13.

In Scotland, where there are no biſhops, the power of ordination is lodged in the preſbytery. See PRESBYTER.

ORDNANCE, a general name for all sorts of great guns, used in war. See the articles CANNON and GUN.

Office of ORDNANCE, an office kept within the Tower of London, which superintends and disposes of all the arms, instruments, and utensils of war, both by sea and land, in all the magazines, garrisons and forts in Great Britain.

The officers of the ordnance are, 1. The master general, from whom are derived all orders and dispatches relating to the same. 2. The lieutenant-general, who receives orders from the master-general, and sees them duly executed; orders the firing of guns on days of rejoicing, and sees the train of artillery fitted out when ordered to the field. 3. The surveyor-general, who has the inspection of the ordnance, stores, and provisions of war in the custody of the store-keepers: he allows all bills of debt, keeps a check on labourers, *&c.* 4. The treasurer, thro' whose hands passes the money of the whole office, as well for payment of salaries as debentures; as also a clerk of the ordnance, and a clerk of the deliveries, for which see the articles CLERK *of the ordnance*, &c.

ORDONNANCE, in painting, is used for the disposition of the parts of a picture, either with regard to the whole piece, or to the several parts; as the groups, masses, contrasts, *&c.*

In the ordonnance there are three things to be regarded, *viz.* the place or scene, the distribution, and the contrast.

1. As to the first, regard is to be had to the disposition of things which serve as a ground-work; and to the plan and position of bodies; under the former of which, comes the landskip, whether an uninhabited place, where there is full liberty of representing all the extravagancies of nature; or inhabited, where the signs of cultivation, *&c.* must be exhibited. See the article LANDSKIP.

As to the plan of bodies, they are either solid, which again are either so by nature, and must be proportioned to their places; or artificial, where regard must be had to the rules of geometry, perspective, architecture, *&c.* Or the bodies move; which they do either by a voluntary motion, wherein great regard must be had to proportion them to their situation, and to strengthen them by regarding the equilibrium; or by some extraordinary power, as machines, *&c.* where the causes of their motion must appear. Or they are things at a distance, in all which an even plane must still be proposed, to find their precise situation, and settle their place by sudden breaks and distances agreeably to perspective.

In placing the figures, regard is to be had, 1. to the group, which connects the subject, and stays the sight. In this are to be considered the knot or nodus, which binds the group, and the nearness of figures which as it holds them together, may be called the chain: that the group be sustained by something loose and distinct from it, and by the same joined and continued to the other groups; and that the lights and shadows be so disposed, as that the effects of all the parts of a composition may be seen at once. See the article GROUP.

2. As to the actions, forced attitudes are to be avoided, and simple nature should be shewn in her most advantageous postures.

3. As to the drapery, which is to be adjusted, so as it may appear real garments, and not stuff loosely thrown on. See the article DRAPERY.

4. In the contrast, are to be considered the actions, which vary infinitely; the aspects which in actions of the same kind, may, by their difference, make a contrast; the situation, according as they meet above, or under the sight, or are near or at a great distance. And lastly, custom, which indeed extends to all the parts of painting: tho' this is particularly to be regarded in the ordonnance, it is nevertheless to be followed with discretion, taking care to avoid all stiffness and formality.

ORDONNANCE, in architecture, is the composition of a building, and the disposition of its parts, both with regard to the whole, and to one another; or as Mr. Evelyn expresses it, determining the measure of what is assigned to the several apartments. Thus ordonnance is the judicious contrivance of the plan or model; as when the court, hall, lodgings, *&c.* are neither too large nor too small, but the court affords convenient light to the apartments about it: the hall is of fit capacity to receive company; and the bed chambers, *&c.* of a proper size. When these divisions are either too great or too small, with respect to the whole, as where there is a large court to a little house, or a small hall to a magnificent palace, the fault is in the ordonnance.

ORDUNNA, a port-town of Spain, in the province of Biscay: west long. 3° 30', north lat. 43° 15'.

ORE, in natural history, the compound mineral glebe, earth, stone, or other substance; which is rich enough in metallic particles, to be worth the while of being purified; and by this means to separate the metal from it, whether gold, silver, copper, iron, tin, &c. See the articles METAL, GOLD, SILVER, &c.

Ores then are nothing but natural concretes, of metals or semi-metals, mixed with sulphur or arsenic, or with both together; and when such alliances are made by art, we then say, that the metals, or semi-metals are reduced to the state of ores. Some ores are so kindly as to melt readily of themselves; whereas others are so intractable, that they require the assistance of various fluxes, before they will yield the metal. See the article FLUX.

Assayers therefore distinguish ores into fusible, refractory, and not fusible at all. Those are called fusible, which, either by means of a middling fire only, or by adding a fit menstruum to them, melt easily, so as to afford the metal or semi-metal contained in them. The refractory ores are those, which require a very strong and lasting action of the fire, and the addition of proper fluxes, before they will melt in the requisite manner.

All ores lie hidden in earths, stones, or in other minerals, as in matrices: if then these matrices of themselves melt in the fire with very great difficulty, or not at all, the ore contained in them may indeed of its own nature be put in fusion; but yet cannot be delivered of its matrix, because this is not fusible: such are iron-ore, and almost all earths and stones, except the vitrifiable ones; but lime-stone in particular, and stones affected in the same manner in the fire, render the ores intermixed with them the most stubborn of any. Some of these stones, however, being much lighter than the ores, may be easily separated by only pounding, washing, and extinguishing them in water; or by a previous calcination, leaving the weightier particles of the ore at the bottom of the vessel, or trough: these kinds of ores are called decantable; as those ores are called indecantable, which cannot be separated in this manner; and of this last sort are the light brittle ores, that contain a great quantity of sulphur. Finally, if there is in the body of the ore itself any thing intangled, or only adhering to its outside, that will cause the metal contained in it to vanish into a vapour, or turn it to scoria with itself, while the ore is exposed to the fire; then such an ore is said to be hungry, *minera rapax*: the causes of this are commonly arsenic, antimony, and those minerals out of which zinc is produced.

OREBRO, the capital of the province of Nericia, in Sweden; east long. 15°, north lat. 59° 20'.

OREGRUND, a port-town of Sweden, in the province of Upland: east long. 18° 15', north lat. 60° 30'.

ORENSE, or ORTENSE, a city of Spain, in the province of Gallicia: west long. 8° 20', north lat. 42° 36'.

ORFA, a town of Asiatic Turky, in the province of Diarbec: east long 40°, north lat. 36° 15'.

ORFORD, a borough and port-town of Suffolk, thirty miles east of Bury. It sends two members to parliament.

ORGAL, among dyers, denotes the lees of wine dried. See DYEING.

ORGAN, ὀργανον, in general, is an instrument, or machine designed for the production of some certain action or operation; in which sense, the mechanic powers, machines, and even the veins, arteries, nerves, muscles, and bones of the human body, may be called organs. See the articles POWER, MACHINE, VEIN, ARTERY, &c.

The organs of sense are those parts of the body, by which we receive the impressions or ideas of external objects; being commonly reckoned five, *viz.* the eye, ear, nose, palate, and cutis. See the articles SENSE, EYE, EAR, &c.

ORGAN, in music, the largest and most harmonious wind-instrument.

The invention of the organ is very antient, though it is agreed that it was very little used till the eighth century. It seems to have been borrowed from the Greeks. Vitruvius describes an hydraulic one in his tenth book of architecture. The emperor Julian has an epigram in its praise. St. Jerome mentions one with twelve pair of bellows, which might be heard a thousand paces, or a mile; and another at Jerusalem, which might be heard at the mount of Olives.

There is one in the cathedral church of Ulm, in Germany, that is ninety three feet high; and twenty-eight broad; the biggest pipe is thirteen inches in diameter, and it has sixteen pair of bellows.

The modern organ is a buffet, containing several

ſeveral rows of pipes. The ſize of the organ is generally expreſſed by the length of its biggeſt pipe; thus we ſay an organ of thirty-two feet, of ſixteen, of eight, and of two feet.

Church organs conſiſt of two parts, *viz.* the main body, called the great organ; and the poſitive, or little organ, which is a ſmall buffet, commonly placed before the great organ.

The organ has at leaſt one ſet of keys, when it has only one body, and two or three when it has a poſitive or chair-organ: though large organs have four, and ſometimes five ſets of keys; beſides which, the pedals or largeſt pipes have their keys, the ſtops or touches whereof are played by the feet. The keys of an organ are uſually divided into four octaves, *viz.* the ſecond ſub-octave, firſt ſub-octave, middle octave, and firſt octave. Each octave is divided into twelve ſtops or frets, whereof the ſeveral black ones mark the natural ſounds, and the five white, the artificial ones, that is, the ſharps and flats; ſo that the keys uſually contain forty-eight ſtops, or touches. Some organiſts add to this number one or more ſtops in the third ſub-octave as well as in the ſecond. (Note, ſome harpſichords and ſpinnets have their natural ſtops or keys often marked white, and their artificial ones black.) The pedals have about two or three octaves, at the pleaſure of the organiſt, ſo that the number of ſtops is indeterminate.

Each key or ſtop preſſed down, opens a valve or plug which correſponds lengthwiſe with as many holes as there are rows of pipes on the ſound-board: the holes of each row are opened and ſhut by a regiſter, or ruler, pierced with forty-eight holes; by drawing the regiſter, the holes of one row are opened, becauſe the holes therein correſpond with thoſe of the ſound-board, ſo that by opening a valve, the wind brought into the ſound-board, by a large pair of bellows, finds a paſſage into the pipes, which correſpond to the open holes of the ſound-board; but by puſhing the regiſter, the forty-eight holes thereof not anſwering to any of thoſe of the ſound-board, that row of pipes anſwering to the puſhed regiſter are ſhut. Whence it follows, that by drawing ſeveral regiſters, ſeveral rows of pipes are opened; and the ſame thing happens, if the ſame regiſter correſpond to ſeveral rows. Hence the rows of pipes become either ſimple or compound: ſimple, when only one row anſwers to one regiſter; compound, where ſeveral. The organiſts ſay, a row is compound, when ſeveral pipes play upon preſſing one ſtop.

The pipes of the organ are of two kinds; the one with mouths like our flutes; the other with reeds. The firſt, called pipes of mutation, conſiſt, 1. of a foot, AABB (pl. CLXXXIX. fig. 2. n° 1.) which is a hollow cone, and which receives the wind that is to ſound the pipe. 2. To this foot is faſtened the body of the pipe BBDD. Between the foot and the body of the pipe is a diaphragm, or partition, FEF, which has a long, but narrow aperture to let the wind out. Over this aperture is the mouth BBC; whoſe upper lip C, being level, cuts the wind as it comes out at the aperture.

The pipes are of pewter, of lead mixed with a twelfth part of tin, and of wood. Thoſe of pewter are always open at their extremities: their diameter is very ſmall, and their ſound very clear and ſhrill. Thoſe of lead, mixed with tin, are larger; the ſhorteſt open, the longeſt are quite ſtopped; the mean ones partly ſtopped, and having beſides a little ear on each ſide the mouth, to be drawn cloſer, or ſet farther aſunder, in order to raiſe or lower the ſound. The wooden pipes are made ſquare, and their extremity ſtopped with a valve, or tampion of leather. The ſound of the wooden and leaden pipes is very ſoft; the large ones ſtopped, are uſually of wood; the ſmall ones of lead. The longeſt pipes give the greateſt ſound; and the ſhorteſt, the moſt acute: their lengths and widths are made in the reciprocal ratio's of their ſounds; and the diviſions regulated by their rule, which they call diapaſon. But the pipes that are ſhut, are of the ſame length as the open ones, which yield the ſame ſound. Uſually, the longeſt pipe is fixteen feet: though in extraordinary organs it is thirty-two. The pedal tubes are always open, though made of wood, and of lead.

A reed-pipe conſiſts of a foot, AABB, (*ibid.* n° 2.) which carries the wind into the ſhalot, or reed CD, which is a hollow demi-cylinder, fitted at its extremity D, into a kind of mould, by a wooden tampion G. The ſhalot is covered with a plate of copper, KKII, fitted at its extremity II, into the mould by the ſame wooden tampion. Its other extremity

KK,

KK, is at liberty; fo that the air entering the fhalot, makes it tremble or fhake againft the reed; and the longer that part of the tongue which is at liberty IL, is made, the deeper is the found. The mould II, which ferves to fix the fhalot or reed, the tongue, tampion, &c. ferves alfo to ftop the foot of the pipe, and to oblige the wind to go out wholly at the reed. Laftly, in the mould is foldered the tube HH, whofe inward opening is a continuation of that of the reed. The form of this tube is different in the different ranks of pipes. The degree of acutenefs and gravity in the found of a reed-pipe, depends on the length of the tongue, and that of the pipe CK, taken from the extremity of the fhalot, to the extremity of the tube. The quality of the found depends on the width of the reed, the tongue, and the tube; as alfo on the thicknefs of the tongue, the figure of the tube, and the quantity of wind.

To diverfify the founds of the pipes, they add a valve to the port-vent, which lets the wind go in fits or fhakes.

Hydraulic ORGAN, denotes a mufical machine that plays by means of water inftead of wind. Of thefe there are feveral in Italy in the grottoes of vineyards. Ctefebes of Alexandria, who lived in the time of Ptolemy Evergetes, is faid to have firft invented organs that played by compreffing the air with water, as is ftill practifed. Archimedes and Vitruvius have left us defcriptions of the hydraulic organ.

In the cabinet of queen Chriftina is a beautiful and large medallion of Valentinian, on the reverfe whereof is feen one of thefe hydraulic organs; with two men, one on the right, the other on the left, feeming to pump the water which plays it, and to liften to its found. It has only eight pipes, placed on a round pedeftal.

ORGANICAL, in the antient mufic, was that part performed by inftruments. See the article MUSIC.

The organical comprehended three kinds of inftruments, *viz.* the wind inftruments, as trumpets, flutes, hautboys, &c. ftringed-inftruments, as lutes, lyres, violins, harpfichords, &c. and pulfative inftruments, or thofe played by beating with the hands or fticks, as drums, &c. See the feveral articles TRUMPET, &c.

ORGANICAL PART, is that part of an animal or plant, deftined for the performance of fome particular function.

ORGANICAL DISEASE, a difeafe in an organical part of the body, whereby its function is impeded, fufpended, or deftroyed.

ORGANICAL *defcription of curves*, the method of defcribing them on a plane by means of inftruments. See CURVE.

ORGANO, in mufic, fignifies the thorough bafs. It is ufually fcored with figures over the notes for the harpfichord, bafs-viol, and lute.

ORGANO PICCIOLO, a chamber or little organ, ufed to play in a fmall room; being about two or three feet high, that is, its largeft pipe is that length: it is made in a fmall buffet like the pofitive, or little organ of a church. See ORGAN.

ORGASM, *orgafmus*, an ecftacy, or impetuous defire of coition, occafioned by a turgefcency of the feminal veffels.

Certain female animals have an orgafm at particular feafons of the year.

ORGIA, ὄργια, in antiquity, feafts and facrifices performed in honour of Bacchus, inftituted by Orpheus, and chiefly celebrated on the mountains by wild, diftracted women, called bacchæ. See BACCHANALIA and DIONYSIA.

ORGIVA, a town of Spain, in the province of Granada, twenty-five miles fouth of Granada.

ORGUES, in the military art, are thick, long pieces of wood pointed at one end, and fhod with iron, clear one of another; hanging each by a particular rope, or cord, over the gate-way of a ftrong place, perpendicularly, to be let fall in cafe of an enemy. Their difpofition is fuch, that they ftop the paffage of the gate, and are preferable to herfes or portcullifes; becaufe thefe may be either broke by a petard, or they may be ftopped in their falling down; but a petard is ufelefs againft an orgue, for if it break one or two of the pieces, they immediately fall down again, and fill up the vacancy; or if they ftop one or two of the pieces from falling, it is no hindrance to the reft.

ORGUES is alfo ufed for a machine, compofed of feveral harquebufs or mufquet-barrels, bound together, by means whereof feveral explofions are made at the fame time, ufed to defend breaches and other places attacked.

ORGYA, an antient grecian meafure, containing fix feet. See MEASURE.

ORIA, a town of Italy, in the kingdom of Naples, and territory of Otranto, fituated

ated thirty miles north-weſt of the city of Otranto.

ORICHALCUM, or AURICHALCUM, braſs. See the article BRASS.

It is evident, from all accounts, that the orichalcum of the antients was a ficti-tious ſubſtance, not a natural metal: they made it on the ſame baſis that we make braſs at preſent, but they had ſeveral ways of doing it, and diſtinguiſhed it into ſeveral kinds. They had a white ſort in frequent uſe and great eſteem: this was made by mixing an earth with copper while in fuſion, but what that earth was we are not informed. We know ſeveral ways of turning copper white; one of which was much practiſed ſome years ago, and ſpoons, and other utenſils made of it, had the name of alchymy-things: but this was done by means of arſenic, a thing not known to the antients: this therefore could not be the ſame with their white braſs; and indeed, none of our methods ſeem to be the ſame with theirs, ſince the metal is debaſed by all ours, and becomes brittle, whereas in their management, according to their own accounts, it ſeems not to have loſt any thing of its ductility, though it acquired a particular brightneſs. The orichalcum and æs flavum, braſs and yellow copper, are with us ſynonymous terms, but with the antients they were uſed to expreſs different combinations of the ingredients.

ORIENT, *oriens*, in geography and aſtronomy, the eaſt, or eaſt-point of the horizon; thus called, becauſe it is the point where the ſun riſes. Hence the equinoctial orient is uſed for that point of the horizon wherein the ſun riſes, when he is in the equator, or when he enters the ſigns of aries and libra; æſtival orient, is the point wherein the ſun riſes in the middle of ſummer, when the days are longeſt; and the hibernal orient, the point where the ſun riſes in the middle of winter, when the days are ſhorteſt.

ORIENTAL, ſomething ſituated towards the eaſt with regard to us, in oppoſition to occidental. See OCCIDENT.

ORIFICE, the mouth, or aperture of a tube, pipe, or other cavity.

In anatomy, this term is particularly applied to the mouths of the ſeveral ducts, veſſels, and other cavities, as of the bladder, uterus, ſtomach, &c. See the article BLADDER, &c.

It is alſo uſed for the aperture of a wound, or ulcer. See WOUND and ULCER.

ORIGANUM, WILD MARJORAM, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, the corolla whereof conſiſts of a ſingle ringent petal, the tube is cylindric and compreſſed, the upper lip is erect, obtuſe, and emarginated, and the lower divided into three ſegments; there is no pericarpium, the cup is connivent, and contains four roundiſh ſeeds.

This plant is heating, diſſolving, and ſtimulating; whence it is of uſe in exulceration of the lungs, &c. It is alſo adapted to diſeaſes of the kidneys, and is balſamic.

ORIGENISTS, in church-hiſtory, a chriſtian ſect in the fourth century, ſo called from their drawing their opinions from the writings of Origen. The origeniſts maintained, that the ſouls of men had a pre-exiſtent ſtate, that they were holy intelligences, and had ſinned in heaven before the body was created: that Chriſt is only the ſon of God by adoption, that he has been ſucceſſively united with all the angelical natures, and has been a cherub, a ſeraph, and all the celeſtial virtues, one after another; that in future ages, he will be crucified for the ſalvation of the devils, as he has already been for that of men, and that their puniſhment, and that of the damned, will continue only for a certain limited time.

ORIGINAL, a firſt draught or deſign of any thing, which ſerves as a model to be imitated or copied.

ORIGINAL SIN, the crime of eating the forbidden fruit, of which it is ſaid, all mankind are guilty at their conception by the imputation of Adam's tranſgreſſion; which is accounted for by ſuppoſing that Adam, as he was to be the father, was alſo the fœderal head, and repreſentative of the whole human race; and that on his ſinning, all that were to ſpring from him partook of his crime. Father Malebranche endeavours to account for original ſin from natural cauſes, and ſuppoſes that our firſt parents, after their tranſgreſſion, received ſuch deep traces in their brain by the impreſſion of ſenſible objects, that it was very poſſible they might communicate them to their children; and that as, according to the order eſtabliſhed by nature, the thoughts of the ſoul are conformable to the traces in the brain, it may be ſaid, that as ſoon

as

as we are formed in the womb, we are infected with the corruption of our parents: for having traces in the brain like those who gave us being, we necessarily have the same thoughts, and the same inclinations with regard to sensible objects; and that thus, of course, we must be born with concupiscence and original sin. See the article CONCUPISCENCE.

ORIGINALIA, in the exchequer, are transcripts, &c. sent to the remembrancer's office out of the court of chancery: which are thus called, to distinguish them from the recorda, which contain the judgments and pleadings in causes tried before the barons.

ORIGUELLA, a city of Spain, in the province of Valencia: west long. 50′, north lat. 38° 20′.

ORILLON, in fortification, is a small rounding of earth faced with a wall; raised on the shoulder of those bastions that have casemates, to cover the cannon in the retired flank, and prevent their being dismounted by the enemy. See the articles BASTION and FORTIFICATION.

ORION, in astronomy, a constellation of the southern hemisphere; consisting of thirty-seven stars, according to Ptolemy; of sixty-two, according to Tycho; and of no less than eighty, in the Britannic catalogue.

ORION'S RING, in astronomy, a constellation more usually called eridanus. See the article ERIDANUS.

ORISTAGNI, a city and port-town of the island of Sardinia: east long. 8° 30′, north lat. 39° 30′.

ORIXA, the capital of the province of the same name, in the hither India, situated on the west side of the bay of Bengal.

ORKNEY ISLANDS, certain islands on the north of Scotland, from which they are separated by a frith twenty miles in length, and ten in breadth. These islands are forty in number, and together with the island of Zetland send one member to parliament, and another for the burghs of Kirkwall, &c.

ORLAMUND, or ORLAMUNDA, a town of Germany, in the circle of Upper Saxony, fifty miles south-west of Leipsic.

ORLE, ORLET, or ORLO, in architecture, a fillet under the ovolo or quarter round of a capital. When it is at the top or bottom of the shaft, it is called cincture. See the article CINCTURE.

Paladio uses the word orlo, for the plinth of the bases of the columns.

ORLE, in heraldry, an ordinary in form of a fillet drawn round the shield, near the edge or extremity thereof, leaving the field vacant in the middle. Its breadth is but half that of the tressure or bordure, which contains a sixth part of the shield; and the orle, only a twelfth: besides that the orle is its own breadth distant from the edge of the shield, whereas the bordure comes to the edge itself. The form of the orle is the same with that of the shield, whence it resembles an escutcheon. See pl. CLXXXVIII. fig. 5. which represents an orle argent in a field gules.

ORLEANOIS, a province or government of France, bounded by Normandy and the isle of France, on the north; by Champaign and Burgundy, on the east; by Lyonois and Guienne, on the south; and by Britany and the bay of Biscay, on the west.

ORLEANS, a city of France, capital of Orleanois, situated on the river Loire, in east long. 2°, north lat. 47° 55′.

ORLEANS is also the name of an island and town on the river of St. Laurence, in Canada: west longitude 73°, north latitude 47°.

ORLOPE, in the sea-language, the uppermost space or deck in a great ship, reaching from the main-mast to the mizen. In three-deck ships the second and lowest decks are sometimes called orlopes.

ORMOND, the north division of the county of Tipperary, in Ireland.

ORMSKIRK, a market-town of Lancashire, situated twenty-six miles south of Lancaster.

ORMUS, an island at the entrance of the gulph of Persia, situated opposite to Gombron on the continent, in east long. 56°, north lat. 27° 30′.

This island is thirty miles in circumference.

ORNAMENTS, in architecture, are used to signify all the sculpture or carved-work wherewith a piece of architecture is enriched.

Vitruvius and Vignola also use the word to signify the entablature.

Ornaments in relievo, are those cut in the contours of the mouldings, as leaves, shells, scrolls, flowers, &c.

Ornaments in creux, are such as are cut within the mouldings, as eggs, flutes, &c. See the article MOULDING.

ORNITHOGALUM, STAR OF BETHLEHEM, in botany, a genus of the hexandria-monogynia class of plants, the corolla whereof consists of six petals, of a lanceo-

lanceolated figure, from the baſe to the middle erect, from thence to the points planopatent; they are permanent, but loſe their colour: the fruit is a round angulated capſule, formed of three valves, and containing three cells: the ſeeds are numerous and roundiſh, the receptacle columnar.

The root of this plant is uſed both crude and boiled; and the ſeed is baked along with bread.

ORNITHOLOGY, that branch of zoology, which treats of birds. See BIRD. Linnæus, whoſe ornithology we have chiefly followed, arranges the whole claſs of birds under ſix orders, according to the different figures of their beaks, *viz.*

1. The accipitres, or birds with uncinated or hooked beaks. See plate CXC. fig. 1.

2. The picæ, or birds that have convex and compreſſed beaks, like that repreſented, *ibid.* fig. 2.

3. The anſeres, comprehending ſuch birds as have depreſſed, and dentated or ſerrated beaks, *ibid.* n° 3.

4. The ſcolopaces, or thoſe furniſhed with ſubcylindric and obtuſe beaks. See *ibid.* fig. 5.

5. The gallinæ, or birds which have the beak of a conic form, but crooked, and the upper chap imbricated. *ibid.* fig. 5.

6. The paſſeres, or birds with conic and ſharp-pointed beaks, like that repreſented *ibid.* fig. 6.

In the deſcription of birds, the feet, wings, and tail, are chiefly attended to.

In moſt birds the toes are four in number, three ſtanding forwards, and one backwards, as repreſented *ibid.* fig. 7, 8, 9. In ſome two toes ſtand forward, and two backward, *ibid.* fig. 10. Some feet, again, are palmated, or have the toes connected together by a membrane, *ibid.* fig. 9. and others ſemi-palmated. *ibid.* fig. 8.

With regard to the wings, the long quill-feathers, marked 1, 2, 3, *&c.* fig. 12. are called by authors remiges, as ſerving to fly with; and the other feathers, placed over the reſt of the body, tectrices. The long feathers of the tail are called rectrices, as ſerving to ſteer the bird's courſe through the air. *ibid.* fig. 11.

As to the other terms made uſe of in the deſcription of birds, they are theſe: cera expreſſes the membrane or naked tunic, which ſurrounds and extends itſelf over more or leſs of the baſe of the beak; urrhopigium is the rhump; and as to other terms, they will be found explained under their ſeveral heads.

ORNITHOMANCY, a ſpecies of divination, performed by means of birds; being the ſame with augury. See the articles DIVINATION and AUGURY.

ORNITHOPUS, BIRD'S FOOT, in botany, a genus of the diadelphia-decandria claſs of plants, with a papilionaceous flower: its fruit is an oblong, jointed pod, of a cylindrical figure, and containing in each joint a ſingle roundiſh ſeed: add to this, that ſeveral of theſe pods uſually grow together.

The leaves of this plant are ſaid to be good for an hernia, and for breaking and expelling the ſtone of the kidneys or bladder.

OROBANCHE, BROOM-RAPE, in botany, a genus of the didynamia-angioſpermia claſs of plants, the corolla of which is monopetalous and ringent; and its fruit an oblong capſule formed of two valves, and containing a great many minute ſeeds.

The leaves of this plant, dried, and reduced to a powder, afford great relief in extreme pains of the colic; and its ſyrup is recommended againſt the hypochondriac affection.

OROBUS, BITTER-VETCH, in botany, a genus of the diadelphia-decandria claſs of plants, with a papilionaceous flower, and a rounded bivalve pod for its fruit, containing numerous roundiſh ſeeds.

It agrees in virtues with ervum. See the article ERVUM.

ORONOQUE, a river of South America, which falls into the Atlantic ocean in 8° north lat. almoſt oppoſite the iſland of Trinity.

ORONTIUM, in botany, a genus of the hexandria monogynia claſs of plants, whoſe calyx is a ſingle cylindric ſpadix, covered with floſcules; the corolla conſiſts of ſix permanent roundiſh petals; the fruit is a ſmall follicle, immerſed in the ſpadix with the corolla, and containing a roundiſh, fungous, and ſingle ſeed.

ORPELLO, in the glaſs-trade, calcined bark reduced to a black powder.

OROPESA, a town of New Caſtile, fifty miles weſt of Toledo.

OROPEZA, a city of Peru: weſt long. 66°, ſouth lat. 20°.

ORPHAN, a fatherlefs child, or minor; or one that is deprived both of father and mother.

The lord mayor and aldermen of the city of London have the cuftody of the orphans of deceafed freemen, and alfo the keeping of their lands and goods. Accordingly, the executors of fuch freemen are to exhibit true inventories of their eftates, and give fecurity to the chamberlain of London for the orphan's part.

By ftatute of 5 and 6 Will. and Mary, c. 10. a certain fund is to be applied for the payment of debts due to orphans, by intereft at 4 *per cent.* And no perfon is compellable to pay into the chamber of London, any fum of money or perfonal eftate, belonging to the orphan of any freeman for the future.

ORPHUS, in ichthyology, the fparus with the tail not forked, and with a black fpot near it. See the article SPARUS.

ORPIMENT, *auripigmentum,* in natural hiftory, a foffile fubftance ufually found in copper-mines, compofed of thin flakes, like the talcs; which eafily fplit, and are flexible, and not elaftic, foluble in oil, fufible in a moderate fire, and yielding in burning an offenfive fmell like garlic.

Of this genus of foffils, there are only three known fpecies: 1. A broad-flaked, gold-coloured kind, well known among the antients, as is plain from the defcription of it left us by Diofcorides, and much efteemed at prefent by our painters. This is found in feveral places, as in the iflands of the Archipelago, in the mines of Goffelaer, in Saxony, in fome parts of Turky, and in the Eaft-Indies, and in its utmoft purity about Smyrna; this makes the fineft of all yellows in painting. 2. The fmall-flaked, yellow kind, which is the common orpiment of the fhops, and is a fine colour, though greatly inferior to the former. This is found in many parts of the turkifh dominions, and in Germany. And, 3. Red-orpiment. This has been a name given by the more judicious to fandarach, and, by the vulgar, to red arfenic, but is to be reftrained only to this foffile, which is of a fine bright red, and of the regular texture of the orpiments, and anfwering all their characters. This is a very beautiful fubftance of a fine bright red, very gloffy, and a little tranfparent, and is found in the turkifh dominions, in the iflands of the Archipelago, and even in Cornwall, where it is known under the name of red mundic.

The englifh druggifts are guilty of an unpardonable piece of ignorance, in that, in general, they know no difference between yellow orpiment, and the yellow fictitious arfenic, which they regularly fell under its name. The orpiment is known to be a fafe internal medicine, and the thing they fell under its name is a very terrible poifon. The colour-men, however, who fell both, are well acquainted with the difference.

The errors that have arifen from the confufion of names between orpiment and arfenic, have not been, even to this time, thoroughly fet right; fome accounting orpiment a poifon, others an innocent medicine. It is certain that the fmell of garlic, which orpiment emits, while burning, and its effects in turning copper white by its vapour, favour greatly of its containing arfenic, fince they are qualities of that mineral; yet we have numerous accounts of its having been given with fafety. The antients gave it internally, and ordered its fumes, while burning, to be received into the mouth in afthma's, and difeafes of the lungs; and the Chinefe, at this time, gave it a place among their cathartic medicines, after it has been burnt a little.

Among the modern writers on thefe fubjects, Geoffroy declares it a corrofive and poifonous mineral, and tells us, that the fymptoms it brings on are fpafms of the head and feet, ftupors, cold fweats, palpitations of the heart, fwooning, thirft and heat, vomitings and tormina of the bowels, and, finally, death itfelf; he adds, that in bodies opened after death, brought on by this poifon, the throat, ftomach, and inteftines have been found inflamed, eroded, and even perforated.

On the other hand, Boerhaave declares orpiment an innocent and harmlefs medicine: and Hoffman, who has been at more pains than any body to examine into its nature, declares the fame; and even gives inftances of its being given to dogs without any harm.

It is an excellent depilatory mixed with lime, and made into a pafte with water. The painters are fond of it as a gold-colour; and a lixivium of it, with quick lime, makes fympathetic ink. See INK.

ORPINE, *anacampferos,* or *telephium,* in botany,

botany, is a ſpecies of ſedum, with terminatory cluſters of flowers. See the article SEDUM.

The leaves of orpine are accounted vulnerary and aſtringent; being chiefly uſed for eroſions of the inteſtines in the dyſentery.

Baſtard ORPINE, *telephiaſtrum*, is alſo called by Linnæus anacampſeros: it is a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of five roundiſh, concave, and patent petals: the fruit is a triangular and unilocular capſule, conſiſting of three valves, and containing a great many roundiſh ſeeds.

ORRERY, a curious machine, or movement, for repreſenting the motions and appearances of the heavenly bodies. See plate CXCI. fig. 1.

The orrery, or planetarium, is fixed in a frame of ebony, contained by twelve vertical planes, on which are repreſented the twelve ſigns of the zodiac. The upper ſurface is flat, of poliſhed braſs, on whoſe outward circumference are ſcrewed in twelve braſs pillars, which ſupport a large flat ſilvered ring marked 12, repreſenting the ecliptic, with ſeveral circles drawn upon it. The three innermoſt are divided into twelve parts for the ſigns of the zodiac, each of which is divided into thirty degrees, and among theſe degrees are graved in their proper places, the nodes, aphelia, and greateſt north and ſouth latitudes of the planets. Between the next two circles are the cardinal points. The next three circles have the months and the days of the month, according to the new ſtile. Upon the braſs-ſurface of the machine are graduated ſilver-circles, which carry the planets (repreſented by ſilver-balls) upon arbors or ſtems, that raiſe them up to the height of the plane of the ecliptic; and turning about the handle or winch of the orrery, all the planets move at their proportional diſtances from a little gilt ball in the middle, which repreſents the ſun; and perform their revolutions according to their periodical times. There are fixed indices of blued ſteel, which ſhew the longitudes of the planets, by pointing to the diviſions of the ſilvered rings or circles, as they move round. But as theſe circles, being concentric, give only the mean diſtances, the true orbits, according to their excentricities, are graved on the outſide of each circle, with the periodical times taken from the tables, to ſhew what the revolutions are, nearer than can be performed by any machine. The nodes and aphelia, with the places of greateſt north and ſouth latitudes, are alſo marked on thoſe orbits. In the middle of this large circle, deſigned to repreſent the ecliptic, is fixed a globe, 1, to repreſent the ſun. Next the ſun is a ſmall ball, 2, to repreſent mercury. Next to this is venus, 3, repreſented by a larger ball. And, at a greater diſtance from the ſun, you ſee the earth, 4, repreſented by an ivory-ball, ſurrounded, at ſome diſtance, by a ring, which expreſſes the orbit of the moon, making an angle with the circle that repreſents the ecliptic, and thereby ſhewing the inclination they have to each other in the heavens, and alſo the line of the nodes. Within the ſame ring is another ivory-ball, 5, with a black cap or caſe, to repreſent the moon; the cap is contrived always to cover that hemiſphere, which is turned from the ſun, and thereby diſtinguiſh the enlightened part from the dark ſide, and conſequently, her age. 6 repreſents mars. 7 is jupiter attended with his ſatellites, or four moons. And 8, the outmoſt of all the planets, is ſaturn with his ring or belt, and five ſatellites or moons. All theſe are fixed upon ſmall ſtems, which ſeverally repreſent their axes, each of which hath its peculiar and proper inclination to the plane of that circle which repreſents the ecliptic. 9 is a dial-plate; 10, 10, 10, meridians; 11, the equator; 12, the ecliptic with its circles, already deſcribed; 13, 13, two keys for locking and unlocking the diurnal and annual motions; and as to the arctic circle, tropic of cancer, and moveable horizon, they are named in the figure.

By means of the orrery, a great many perſons, who have not time to apply themſelves to the ſtudy of aſtronomy, and yet are deſirous to be acquainted with the celeſtial appearances, in a few days may get a competent knowledge of ſeveral phænomena, and eſpecially, be cured of the common prejudices againſt the motion of the earth, and the copernican ſyſtem. See COPERNICAN.

But the principal uſe of the orrery is to render the theory of the earth and the moon eaſy and intelligible; and to evidence to our ſenſes how all theſe appearances happen, which depend on the annual or diurnal rotation of the earth, and the monthly revolutions of the moon: as

as the variety of ſeaſons, the viciſſitudes and various lengths of days and nights, the manner of ſolar and lunar eclipſes, the various phaſes of the moon, *&c.* There have been various forms invented for this noble inſtrument, two of which have principally obtained, *viz.* the hemiſpherical orrery, and the whole ſphere: though the orrery at firſt was made without any ſphere, with only the ſun, the earth, and moon revolving about it; but as this was too imperfect a ſtate, they ſoon began to inveſt it, ſome with a half ſphere, and others with a whole ſphere, to be an adequate repreſentation of the ſolar ſyſtem.

The hemiſpherical orrery, as that above deſcribed, has been made in greater numbers than any other, on account of their being made much cheaper and eaſier than thoſe in a ſphere of the ſame ſize; there being a vaſt difference between placing an hemiſphere on the box of an orrery, and diſpoſing an orrery in a large moveable ſphere. But the idea given us by the former, is very imperfect and unnatural in compariſon of the latter, and it is ſurpriſing to think how they ſhould have had ſo great a run. An orrery, therefore, adapted to an armillary ſphere, is the only machine that can exhibit a juſt idea of the true ſyſtem of the world, with the diurnal and annual motions of the heavenly bodies. It is likewiſe capable of exhibiting the third motion of the earth, *viz.* that motion of the earth by which the poles of the world revolve about the poles of the ecliptic, and occaſions what is commonly called the preceſſion of the equinoxes, or more properly the retrogreſſion of the earth's nodes.

As the diſtances are in their true proportions to each other, ſo likewiſe are the bodies of the planets in their juſt proportions to one another. But it cannot be expected, that the diameters of the planets ſhould be in proportion to the diameters of the orbits; becauſe taking jupiter under three inches diameter, and the earth a little more than a quarter of an inch, it would require the ſyſtem to be of the bigneſs of a mile and $\frac{3}{4}$, the orbit of ſaturn 9000 feet in diameter, and ſo on of the reſt; which would make the machine 3000 times bigger than it is. And if the bodies were ſuited to the dimenſions given, the bodies muſt be 3000 times leſs, which would render them all inviſible, but the ſun; and that would be leſs than $\frac{1}{100}$th part of an inch. For this reaſon, as a ball big enough to repreſent the ſun cannot be put on, we are to ſuppoſe the ſun (in reſpect of them) as big as the inner circle of the ſilver-ring, which repreſents the ecliptic.

As the orbit of the moon, and the orbits of the ſatellites of jupiter and ſaturn, are quite loſt in this proportion of the orbits of the primary planets, much more are the ſatellites themſelves; therefore the ſatellites are uſually not put on in this poſition of the machine. But ſaturn's ring is joined to ſaturn's body, according to its proportion, and the inclination of its plane to the plane of ſaturn's orbit: and as the planet is carried round, the ring always moves parallel to itſelf, as it does in the heavens. Thereby we ſee why the inhabitants of the earth, in one revolution of ſaturn, ſee the ring twice in the moſt open ſituation of the anſæ, as at 8, and twice, as if it had no ring, that is, when the edge of the ring is towards the earth (the plane of the ring going thro' the obſerver's eye) and the ſucceſſive increaſing and decreaſing of the viſible bigneſs of the anſæ.

Jupiter, with his moons, is repreſented at 7, and the ſpots whereby his revolution has been obſerved.

When you have a complete idea of the proportional bigneſs of the planets, jupiter and ſaturn are taken off, and others put on three times leſs than the former, in order to put ſatellites about them (and at the ſame time the moon is joined to the earth) and ſhew how the ſatellites accompany their primary planet in its courſe round the ſun. Theſe ſatellites, which are pearls upon crooked ſtems, do not turn by clock-work round their primaries (as has been done in ſome large orreries) but are only ſet by the hand; becauſe, to do it, would be only a needleſs expence, to give a falſe notion of their bigneſs, diſtances, and inclination of their orbits, in reſpect of their primaries. But to give a right notion of jupiter and his ſatellites, and of ſaturn and his ſatellites, there is ſhewn for each of theſe planets a ſyſtem a-part, where the diſtances from the primary, and the bigneſs of the ſatellites, are expreſſed: and in this ſyſtem, though jupiter is but of about an inch diameter, the outermoſt ſatellite is as far diſtant from jupiter's center, as ſaturn is from the ſun in the machine; which ſhews the inconſiſtency and

and disproportion of making the satellites to move round jupiter in an orrery. Saturn's satellites are still more improperly put in; because four of them move in orbits very much inclined to saturn's ecliptic (*viz.* in an angle of above thirty degrees) and the fifth hath its orbit almost in the same plane as saturn's ecliptic, with a diameter greater than the diameter of the whole orrery, even when saturn is three times less than the saturn of the orrery.

The next thing which is put on, is a contrivance to shew, that all the confusion of the planets-motions in the ptolemaic hypothesis (called their stations and retrogradations) is not really, but apparently so, in the copernican or true system of the world. And this is done by two steel-indices, one of which being always applied to the sun, and successively to the top of the stem of the planet to be examined, whilst the other is applied to the earth (as a center) and the said planet: by turning the handle of the machine, the heliocentric and geocentric places of the planet are seen on the ecliptic at the same time; shewing why the planets seem to go backwards and forwards when viewed from the earth; tho' they go all the while regularly from west to east, as they would be seen from the sun.

When the machine is put in motion, all these bodies move round that which represents the sun, and, at the same time, both that, and all those which represent such of the planets as have been observed to have a rotation about their axis, turn round upon the said stems, and in their proper times. The satellites, or moons, also revolve about their primaries at the same time; and the ring that represents the orbit of the moon has likewise its proper motion, whereby that of its nodes is also expressed. The whole machine is put into motion by turning a small winch, 14, like the key of a clock, with very little strength. And, above this winch, is a cylindrical pin, which may be drawn a little out, or pushed in at pleasure: when it is pushed in, all the planets, both primary and secondary, will move according to their respective periods, by turning the handle or winch: when it is drawn out, the motions of the satellites of jupiter and saturn will be stopped, while all the rest move freely. In the place of the sun, you may fix a brass-lamp, with two convex-glasses, made on purpose; which, being placed with the glass directly to the earth, and turning round in the same time with the earth, throws a continual strong light upon it and the moon, in whatever part of its orbit it is; and so not only the times in which the eclipses of the sun and moon will happen, are shewn, but the phænomena themselves are truly represented.

When you propose to use this machine, place a small black patch, or a bit of wafer, upon the middle of the sun, right against the first degree of ♈: you may also place patches upon venus, mars, and jupiter, right against some noted point in the ecliptic; put on the handle, and push in the pin which is just above it. One turn of this handle answers to a revolution of the ball, which represents the earth, about its axis; and, consequently, to 24 hours of time, as may be seen by the motion of the hour-index, 9, which is marked, and placed at the foot of the wire, on which the ball of the earth is fixed: again, when the index has moved the space of ten hours, jupiter makes one complete revolution round its axis; and so of the rest.

By these means the revolutions of the planets, and their motions round their own axes, will be represented to the eye. And it is worth observation, that the diurnal motion of the planets was discovered, by observing the motions of the spots upon the surface of the sun, and of the planets in the heavens, after the same manner as we here observe the motions of their representatives, by that of the marks placed upon them in this machine.

This machine is so contrived, that the winch may be turned either way; so that, the same number of revolutions being made backwards, they will bring all the planets to their former aspects or situations in respect to each other.

It would be too great an undertaking here to give an account of the mechanism of the larger sort of orreries, which represent the movements of all the heavenly bodies; nor, indeed, can it be done either by diagram or description, to render it intelligible to the most discerning reader; but, instead of that, we shall exhibit an idea of the theory and structure of an useful, concise, and portable planetarium, which any gentleman may have made for a small expence, and will exhibit, very justly, the motions of all the primary

mary planets about the ſun, by wheel-work; and thoſe that have ſecondaries, or moons, may have them placed about their primaries moveable by the hand, ſo that the whole ſhall be a juſt repreſentation of the ſolar ſyſtem, or true ſtate of the heavens, for any given time of the year.

In order to this we muſt compare, and find out the proportion, which the periodical times, or revolutions of the primary planets, bear to that of the earth; and they are ſuch as are expreſſed in the table below, where the firſt column is the time of the earth's period in days and decimal parts; the ſecond, that of the planets; the third and fourth are numbers in the ſame proportion to each other: as,

365,25 : 88	☿ :: 83 : 20,	for merc.
365,25 : 224,7	♀ :: 52 : 32,	for venus.
365,25 : 686,9	♂ :: 40 : 75,	for mars.
365,25 : 4332,5	♃ :: 7 : 83,	for jupit.
365,25 : 10759,3	♄ :: 5 : 148,	for ſat.

If we now ſuppoſe a ſpindle or arbor with ſix wheels fixed upon it in an horizontal poſition, having the number of teeth in each, correſponding to the numbers in the third column, *viz.* the wheel A M (*ibid.* fig. 2.) of 83 teeth, B L of 52, C K of 50 (for the earth), D I of 40, E H of 7, and F G of 5; and another ſet of wheels moving freely about an arbor, having the number of teeth in the fourth column, *viz.* A N of 20, B O of 32, C P of 50 (for the earth), D Q of 75, E R of 83, and F S of 148; then, if thoſe two arbors of fixed and moveable wheels are made of the ſize, and fixed at the diſtance from each other, as here repreſented in the ſcheme, the teeth of the former will take thoſe of the latter, and turn them very freely, when the machine is in motion.

Theſe arbors, with their wheels, are to be placed in a box, of an adequate ſize, in a perpendicular poſition: the arbor of fixed wheels to move in pivots at the top and bottom of the box; and the arbor of moveable wheels to go through the top of the box, to a proper height, on the top of which is to be placed a round ball, gilt with gold, to repreſent the ſun. On each of the moveable wheels is to be fixed a ſocket, or tube, aſcending above the top of the box, and having on the top a wire fixed, and bent at a proper diſtance into a right angle upwards, bearing on the top a ſmall round ball, repreſenting its proper planets.

If then on the lower part of the arbor of fixed wheels be placed a pinion of ſcrew-teeth, a winch turning a ſpindle with an endleſs ſcrew, playing in the teeth of the arbor, will turn it with all its wheels; and theſe wheels will move the others about with their planets, in their proper and reſpective periods of time, very exactly. For, while the fixed wheel C K moves its equal C P once round, the wheel A M will move A N a little more than four times round, and ſo will nicely exhibit the motion of mercury; and the wheel F G will turn the wheel F S about $\frac{1}{29,5}$ round, and ſo will truly repreſent the motion of ſaturn: and the ſame is to be obſerved of all the reſt.

ORRICE, the common name of the iris-root. See the article IRIS.

ORSA, a town of Lithuania, ſituated in 30° 40′ eaſt long. and 55° 30′ north lat.

ORSOWA, a town of the bannat of Temeſwaer, ſituated on the north ſide of the Danube, almoſt oppoſite to Belgrade.

ORSOY, a town of Weſtphalia, twenty miles ſouth of Cleves.

ORTA, a town of St. Peter's Patrimony, thirty-five miles north of Rome.

ORTEGAL *caſtle and cape*, the moſt northerly promontory of Spain, thirty miles north-eaſt of Ferrol: weſt long. 8° 22′, north lat. 44°.

ORTEGIA, in botany, a genus of the triandria-monogynia claſs of plants, the calyx of which conſiſts of five erect leaves; there is no corolla; the fruit is a roundiſh capſule, containing but one cell, in which are a great many very ſmall, oblong ſeeds, acute on both ſides.

ORTEIL, in fortification, the ſame with berme. See the article BERME.

ORTHODOX, in church-hiſtory, an appellation given to thoſe who are ſound in all the articles of the chriſtian faith.

ORTHOGONIAL, in geometry, the ſame with rectangled. See RECTANGLED.

ORTHOGRAPHIC *projection of the ſphere*, that wherein the eye is ſuppoſed at an infinite diſtance; ſo called becauſe the perpendiculars from any point of the ſphere, will all fall in the common interſection of the ſphere with the plane of the projection. See PROJECTION and MAP.

ORTHOGRAPHY, that part of grammar which teaches the nature and affections of letters, and the juſt method of ſpelling or writing words with all the proper and neceſſary letters, making one of the four greateſt diviſions or branches of

of grammar. See the articles GRAMMAR, LETTER, WORD, *&c.*

Orthography being, therefore, the doctrine of letters, treats principally of five heads, *viz.* 1. The number and divifion of letters. 2. Their accidents. 3. The juft manner of writing letters, which, properly fpeaking, is orthography. 4. The pronunciation of letters. And, 5. The difpofition of letters into fyllables. See the article PRONUNCIATION, *&c.*

As to orthography, properly fo called, or the right fpelling of words, it muft be learned from the beft authors in each language. However, it ought to be obferved, that orthography has appointed one way of fpelling a word in common language, and another in the learned and polite diction: thus, in ordinary, we fay, and write, *fancy*, *fantom*, *frenzy*, *&c.* for *phantafy*, *phantom*, *phrenzy*, *&c.* according to the original etymology of thefe words: and in fuch cafes, as vulgarifms ought to be carefully avoided, fo as not to write *obftropulus* for *obftreperous*, and the like; fo, on the other hand, we muft not alter the received orthography, in imitation of any one man, be his authority or learning ever fo great; the general ufage being, in this refpect, the only rule that ought to be followed, fince innovations rather confound than help the learner.

We fhall therefore only add one obfervation more, with refpect to the orthography of words, *viz.* that it ought, as much as poffible, to be agreeable to the original etymology, fenfe, and pronunciation of words: thus it is better to write *phrenzy* than *frenzy*, on account of its being derived from the greek φρην; in the fame manner, the participle of the verb *finge* fhould be written *fingeing*, on account of the fenfe, to diftinguifh it from *finging*; and, laftly, when letters are neither neceffary on account of the etymology, fenfe, or found, they ought to be rejected, as *public* for *publick*, the *k* being wholly fuperfluous.

As for that part of orthography which regards fpelling, fee SPELLING.

ORTHOGRAPHY, in geometry, the art of drawing or delineating the fore-right plan of any object, and of expreffing the heights or elevations of each part. It is called orthography, from its determining things by perpendicular lines falling on the geometrical plane.

ORTHOGRAPHY, in architecture, the elevation of a building. This orthography is either external or internal. The external orthography is taken for the delineation of an external face or front of a building; or, as it is by others defined, the model, platform, and delineation of the front of a houfe, that is contrived, and to be built, by the rules of geometry, according to which pattern the whole fabric is erected and finifhed. This delineation or platform exhibits the principal wall with its apertures, roof, ornaments, and every thing vifible to an eye placed before the building. Internal orthography, which is alfo called a fection, is a delineation or draught of a building, fuch as it would appear were the external wall removed.

To lay down the orthography of a building, draw a right line, for a bafe or grounding A B (pl. CLXXXIX. fig. 3.) and at one end erect a perpendicular AD; fet off the width and diftances of the gates, or doors, windows, *&c.* Upon A B and on the right line AD, fet off the heights of the feveral parts vifible in the face of the building, *v. g.* of the doors, windows, the roof, chimnies, *&c.* and apply a ruler to each point of divifion. The common interfections of the right lines drawn from the points parallel to the lines A B and A D, determine the external orthography of the building; and, after the fame manner, is the internal orthography to be laid down.

ORTHOGRAPHY, in perfpective, is the foreright fide of any plane, *i. e.* the fide or plane that lies parallel to a ftraight line, that may be imagined to pafs through the outward convex points of the eyes, continued to a convenient length.

Lamy and others ufe the word fcenography in the fame fenfe.

ORTHOGRAPHY, in fortification, is the profile or reprefentation of a work; or a draught fo conducted, as that the length, breadth, height, and thicknefs of the feveral parts are expreffed, fuch as they would appear if perpendicularly cut from top to bottom. See FORTIFICATION.

ORTHOPNOEA, in medicine, a fpecies or degree of afthma, where there is fuch a difficulty of refpiration, that the patient is obliged to fit or ftand upright, to be able to breathe. See ASTHMA.

ORTIVE, in aftronomy, the fame with eaftern: the ortive or eaftern amplitude, is an arch of the horizon intercepted between where a ftar rifes, and the eaft point of the horizon, or point where the horizon and equator interfect.

ORTON, a market-town of Weſtmoreland, ſituated ten miles ſouth-weſt of Appleby.

ORTYGOMETRA, Daker hen, in ornithology, a genus of birds, of the order of the ſcolopaces, the beak of which is ſhorter than the toes: it is of a compreſſed figure, and terminates in a kind of point; both the chaps are equal in length. There is but one ſpecies of this genus: it is of the ſize of our common magpye, and is a ſingular and elegant bird; the head is ſmall and oblong; the eyes are large, and their iris reddiſh, the pupil is black; the head, neck, back, and tail are of a bright and elegant brown, variegated in a beautiful manner with ſpots of black; the throat is of a pale, whitiſh grey, as are alſo the breaſt and belly.

ORVALA, in botany, a genus of the didynamia gymnoſpermia claſs of plants, the corolla of which conſiſts of a ſingle ringent petal; the tube is of the length of the cup; the limb is erect, long, and divided into four ſegments; there is no pericarpium; the ſeeds, being four in number, and kidney-ſhaped, are contained in the bottom of the cup.

ORVIETANUM, in pharmacy, the name of a celebrated antidote, ſo called, according to Lemery, from Orvietto, a city of Italy, where it was firſt uſed; but, according to others, from Hieronymus Ferrantes Orvietanus, a famous mountebank, who invented it.

The method of preparing this medicine may be ſeen in Lemery's Pharmacopée.

ORVIETTO, a city of Italy, in the pope's territories, capital of the province of Orvietto, ſituated at the confluence of the Tiber and the Chiane: eaſt long. 13°, north lat. 43°.

ORWELL, a river of Suffolk, which, riſing in the middle of that county, runs ſouth-eaſt, by Ipſwich, and falls into the German ſea, at Landguard-fort.

ORYZA, rice, in botany, a genus of the hexandria-digynia claſs of plants, the corolla of which is formed of two obtuſe, large, nearly equal, and permanent valves: the nectarium is compoſed of two leaves, plane, very ſmall, and ſituated on the ſides of the germen; the leaves of it are narrow at the baſe, truncated, and deciduous; there is no pericarpium; the corolla grows to the ſeed, and becomes of an oblong oval figure, compreſſed, thin at the edges, and marked each way with two lines on the ſides; the ſeed is ſingle, large, obtuſe, oblong, and compreſſed.

This plant is cultivated in vaſt abundance in the Eaſt, as alſo in Carolina, for food. It is ſaid to be good in dyſenteries, diarrhœas, &c.

Rice, on importation, pays a duty of 6 s. $4\frac{60}{100}$ d. the hundred weight; and draws back, on exportation, 5 s. 9 d.

OS, in anatomy. See Bone and Mouth.

For the os calcis, os femoris, os frontis, os occipitis, &c. ſee Calcis os, &c.

Os sacrum. See Sacrum os.

OSACA, a great city and port-town of Japan, ſituated on the bay of the ſea, on the eaſt ſide of the iſland, in eaſt long. 135°, north lat. 35°.

OSBECKIA, in botany, a genus of the octandria monogynia claſs of plants, the calyx of which is a ſingle leafed, bell-ſhaped, permanent perianthium; the corolla conſiſts of four roundiſh ſeſſile petals, longer than the cup; the fruit is an oval capſule, covered with the truncated tube of the cup, containing four cells, in which are a great many roundiſh ſeeds: the receptacle is moon-ſhaped.

OSCHEOCELE, in ſurgery, a hernia of the ſcrotum. See the article Hernia.

Of this rupture, ſometimes called hernia ſcrotalis, there are two kinds; a true one, proceeding from a prolapſion of the inteſtine, or omentum; and a ſpurious one, or only apparent, ariſing from a tumour of the teſticles, or ſpermatic veſſels, or a diſtention with air, water, or ſome offending humour: the oſcheocele is therefore diſtinguiſhed into various kinds, according to the different ſubſtances with which the ſcrotum is diſtended, by which it is alſo differently denominated: when the inteſtine is prolapſed through the proceſs of the peritonæum into the ſcrotum, the tumour is then called enterocele; if from the omentum, epiplocele; if from a diſtention with water, hydrocele; if from wind or flatus, pneumatocele; when from blood, hæmatocele; if the teſticle is enlarged beyond its proper dimenſions, it is termed ſarcocele; and when the ſpermatic veins are too much diſtended, it is termed varicocele, cirſocele, or hernia varicoſa; and when an abſceſs is formed in the ſcrotum, it is by ſome termed hernia humoralis; ſometimes two or more of theſe ſubſtances concur together to form the tumour, which is then named conjunctly from them entero-epiplocele, hydro-enterocele, &c. each of theſe may be ſeen ſeparately

parately treated of, under their several heads. See the articles ENTEROCELE, EPIPLOCELE, &c.

OSCHOPHORIA, in antiquity, an athenian festival, instituted by Theseus, in acknowledgement for his having destroyed the Minotaur, and thereby freed his country from the tribute of seven young men, who were to be sent every year into Crete, to be devoured by that monster.

At this festival there was always a race by young men elected out of every tribe, who run from Bacchus's temple to that of Minerva Sciras: the place where the race ended, was called Oschophorion, and the victor's reward was a cup containing a mixture of wine, honey, and oil.

OSCILLA, in antiquity, small images of wax or clay, which were made in the shape of men and women, and consecrated to Saturn, in order to render him propitious.

OSCILLATION, in mechanics, the vibration, or reciprocal ascent and descent of a pendulum. See PENDULUM.

It is demonstrated, that the time of a complete oscillation in a cycloid, is to the time in which a body would fall thro' the axis of that cycloid, as the circumference of a circle to its diameter; whence it follows, 1. That the oscillations in the cycloid are all performed in equal times, as being all in the same ratio to the time in which a body falls through the diameter of the generating circle. 2. As the middle part of the cycloid may be conceived to coincide with the generating circle, the time in a small arch of that circle will be nearly equal to the time in the cycloid: and hence the reason is evident, why the times in very little arches are equal. 3. The time of a complete oscillation in any little arch of a circle, is to the time in which a body would fall through half the radius; as the circumference of a circle, to its diameter; and since the latter time is half the time in which a body would fall through the whole diameter, or any chord; it follows, that the time of an oscillation in any little arch, is to the time in which a body would fall through its chord, as the semi-circle to the diameter. 4. The times of the oscillations in cycloids, or in small arches of circles, are in a subduplicate ratio of the lengths of the pendulums. 5. But if the bodies that oscillate be acted on by unequal accelerating forces, then the oscillation will be performed in times that are to one another in the ratio compounded of the direct subduplicate ratio of the lengths of the pendulums, and inverse subduplicate ratio of the accelerating forces. Hence it appears, that if oscillations of unequal pendulums are performed in the same time, the accelerating gravities of these pendulums must be as their lengths; and thus we conclude, that the force of gravity decreases, as you go towards the equator, since we find that the lengths of pendulums that vibrate seconds, are always less at a less distance from the equator. 6. The space described by a falling body in any given time, may be exactly known: for finding, by experiments, what pendulum oscillates in that time, the half of the pendulum will be to the space required, in the duplicate ratio of the diameter of a circle to the circumference.

Center of OSCILLATION. See CENTER.

OSCINES, among the Romans, an appellation given to such birds, from whose chattering or notes, omens and predictions were drawn; in which sense they stood contra-distinguished from the alites, or such birds as afforded matters for auguries by their flight. See ALITES.

OSCITATION. See YAWNING.

OSERA, a venetian island, in the gulph of Venice: east long. 15° 30′, north lat. 45°.

OSIMO, a town of Italy, in the territories of the pope, and marquisate of Ancona: fifteen miles north west of Loretto.

OSMERUS, in ichthyology, a genus of the malacopterygious class of fishes, the back and belly fins whereof are placed at the same distance from the head; the teeth are large and strong, and placed in both jaws, and also on the tongue and palate; the branchiostege-membrane on each side has seven or eight rays.

This genus comprehends the smelt and tarantola-fish. See the articles SMELT and TARANTOLA FISH.

OSMUNDA, in botany, a genus of the cryptogamia-filicum class of plants, of which no part of the fructification is visible, except the fruit: this is a globose, distinct capsule, many of which are arranged together in clusters, and which, when mature, open horizontally, and are found to contain a great number of very minute seeds of an ovated shape.

This genus comprehends the osmund-royal, and the moonwort.

OSNA-

OSNABURG, the capital of the bifhopric of the fame name, in the circle of Weftphalia: eaft long. 7° 40′, north lat. 52° 31′. The territories of this bifhopric, which are forty miles long, and thirty broad, are fubject to its bifhop: and this bifhopric is alternately held by a proteftant and papift, the proteftant being always a prince of the houfe of Brunfwic.

OSORNO, a town of Chili, in fouth America: weft long. 80°, fouth lat. 41°.

OSPREY, *offifragus*, a bird of the falcon-kind, as big as a large cock, and more generally known by the names of haliætus, and bald-buzzard. See the articles HALIÆTUS and FALCO.

OSSICLE, *officulum*, a little bone, a diminutive of bone, in which fenfe it is frequently ufed by anatomifts.

Botanifts alfo ufe officulum for the ftone of a plumb, cherry, or any other ftone-fruit.

OSSIFICATION, the formation of bones, but more particularly the converfion of parts naturally foft, to the hardnefs and confiftence of bones.

Dr. Nifbet's opinion of offification is, that in the blood, or a fluid fecreted from it, there is an offifying juice confifting of particles that are not apparent: that whenever nature defigns an offification between membranes, or within a cartilage, fhe occafions a more than ufual afflux of this fluid, which fo diftends the veffels that were before invifible, as to make them capable of receiving the red globules of blood, which are always to be feen near the place where offification is begun. In this blood, gritty bony particles are to be felt by the point of a knife, which have been formed by the attraction and cohefion of the particles of the offifying juice obftructed, along with the other groffer fluids in the beginning of the veffels prepared to receive the refluent juices. The blood being capable of forming fine membranes, the membranaceous parts of a bone, which act as a gluten to keep thefe particles and fibres together, if there be any fuch, that do not arife from the coats of its veffels, are produced by a cohefion round the cretaceous particles of a part of the fluid, in which they were generated and contained. Thus the membranes of cartilages ferve as a bed between, or within which the bony particles are depofited, or fhoot; but without any intermixture of the particles of the bone and cartilage, or continuation of the fibres of the one fubftance to thofe of the other, as is evident in cartilages containing bones kept long enough in water, and then flit; for the bone will, as foon as the large veffels that enter its fubftance are divided, flip as eafily from it as an acorn does out of its cup: and there is a fmoothnefs and polifh of the parts of both cartilage and bone, which fhew there is no conjunction of the fibres of the two fubftances. While the bones are increafing within cartilages, the cartilages are extended and fpread out; by which, with the preffure which they fuffer, and the great influx of various fluids, and the nutritious matter being hindered from flowing freely into them, they decreafe continually; and, at laft, may truly be faid to be entirely deftroyed.

For the formation of the bones of a foetus, fee the article FOETUS.

OSSORY, the weft divifion of Queen's County in Ireland.

OSSUNO, a town of Spain, in the province of Andalufia, forty miles eaft of Seville.

OSTAGIO, a town of Italy, in the territory of Genoa, fifteen miles north-weft of Genoa.

OSTATRIC, a town of Spain, in the province of Catalonia, twenty-four miles north-eaft of Barcelona.

OSTEND, a city and port-town of the Auftrian Netherlands, in the province of Flanders, fituated twelve miles weft of Bruges: eaft long. 2°. 45′, north lat. 51° 15′.

OSTEOCOLLA, in natural hiftory, tho' fuppofed by many to be an earth, is truly a cruftated kind of fpar, debafed by earth, and therefore not tranfparent. See the article SPAR.

It is ufually found coating over vegetable, or other bodies, in form of incruftations; fo that the true ofteocolla is a tubular cruftaceous fpar, of a very foul and coarfe texture, and carries with it much more of the appearance of a marl, than of a fpecies of fpar.

The maffes of ofteocolla, though regularly of the fame figure, are very different in fize; fome of them being not thicker than a crow-quill, and others of five and fix inches diameter: it is always, however, of a tubular figure, and wrinkled and rough furface.

Ofteocolla is frequent in Germany, where it is found buried near the furface of the earth, fometimes in ftrata of fand, but more frequently among marls: it fhould

be chosen for use, the purest that can be had of a pale brown colour, and of a tolerably close and firm texture.

It has long been famous for bringing on a callus in fractured bones; its name osteocolla signifying the bone-glue, or bone-binder. It is also recommended as a diuretic, and as good in the fluor albus; but, at present, little regard is paid to it; since, if it has any virtues, they must be wholly owing to spar, which may be given to greater advantage in a purer form.

OSTEOCOPOS, in medicine, any pain in the bones, whether arising from weariness, a sharp scorbutic humour, or a venereal taint. See PAIN.

OSTEOLOGY, that branch of anatomy which treats of the bones. See BONE.

The objects of osteology are the bones, whether they be recent or dried, whether they have belonged to an infant or an adult; and with the bones are to be considered their periosteum, medulla or marrow, the ligaments, and the cartilages. See the articles OSSIFICATION, MEDULLA, &c.

The study of the bones is to be considered in two lights; as theoretical, or as practical. In the first sense, osteology only extends to the external conformation and use of the bones: whereas in the latter or practical sense, it comprehends the more intimate knowledge of their interior structure and connections. 1. If their internal parts are the subjects of enquiry, they are to be cut or broken. 2. If the articulations are to be examined, the ligaments and cartilages, as well as the articulations themselves, must be dissected and carefully observed. 3. If the making a skeleton be the intent, then their preparation and preservation come into this branch. See the articles BONE, ARTICULATION, LIGAMENT, SKELETON, &c.

OSTEOSPERMUM, in botany, a genus of the syngenesia-polygamia-necessaria class of plants, the compound flower of which is radiated; the hermaphrodite corollulæ are numerous in the disc; the female ones are about ten in the radius; there is no other pericarpium but the cup; the hermaphrodite seeds are abortive; the female ones are solitary, globose, coloured, and at length indurated, including a nucleus; the receptacle is naked and plane.

OSTIA, a port-town of Italy, in the pope's territores, situated at the mouth of the Tiber: east long. 13°, north lat. 41° 30′.

OSTIA, in anatomy, an appellation given to the orifices or apertures of the vessels of the body.

OSTIGLIA, a town of the dutchy of Mantua, fifteen miles east of Mantua.

OSTRACION, in ichthyology, a genus of the branchiostegious order of fishes, of a globose, oval, or ovato-quadrangular figure: the skin is always very firm and hard; and is in some species smooth, in others entirely covered with spines; and, finally, in some the spines entirely occupy only particular places: there are no belly-fins, and the others are five in number, *viz.* two pectoral or lateral fins, one on the back, the pinna ani, and the tail. To this genus belong the globe-fish, the horned triangular-fish, the porcupine-fish, sun-fish, &c.

OSTRACISM, ὀστρακισμός, in grecian antiquity, denotes the banishment of such persons whose merit and influence gave umbrage to the people of Athens, lest they should attempt any thing against the public liberty. It was so called, because the people voted a person's banishment, by writing his name on shells, called in greek ὄστρακον, and casting them into an urn.

OSTRACITES, in natural history, the name by which authors call the fossile oyster-shells. See the article OYSTER.

Ostracites has the same medicinal virtues with the belemnites, and lapis judaicus, only in a higher degree; being accounted, by Dr. Lister, one of the greatest known medicines in nephritic cases: the dose, in powder, is from half a dram to a dram, in white wine; and to prevent a sickness at the stomach, that sometimes attends the taking it, one third part of the quantity of powdered chamamile-flowers may be mixed with it.

OSTRACITES is also a kind of cadmia. See the article CADMIA.

OSTRACODERMATA, in natural history, an appellation given to the testaceous shells; especially of the echini marini.

OSTREA, the OYSTER. See the article OYSTER.

OSTRICH, *struthio*, in ornithology, a distinct genus of birds, of the order of the gallinæ: it has only two toes to each foot; and these are both placed forward; and its head is simple, or not ornamented with the appendages which are common to most birds of this order.

The

The oſtrich is the talleſt of all the bird kind, meaſuring ſeven or eight feet when it ſtands erect: its legs are very long and naked; and the ſtructure of the foot, having only two toes, is particular.

OSTROGOTSKOI, a city of Ruſſia, in the province of Belgorod: eaſt long. 40° 30′, north lat. 51° 25′.

OSTUNI, a biſhop's ſee of the kingdom of Naples, eighteen miles north of Taranto.

OSWEGO, a town of the Iroquois, in North America, three hundred miles weſt of Albany, in New-York.

OSWESTRY, a market town in Shropſhire, fifteen miles north-weſt of Shrewſbury.

OSYRIS, POET'S ROSEMARY, in botany, a genus of the diœcia-triandria claſs of plants, without any flower-petals: the fruit is a globoſe unilocular berry, containing a ſingle oſſeous ſeed.

This whole ſhrub is aſtringent, and conſequently good in fluxes.

Oſyris is alſo a name ſometimes uſed for the linaria, or toad-flax.

OTALGIA, the EAR-ACH. See EAR.

OTHONNA, BASTARD-JACOBÆA, in botany, a genus of the ſyngeneſia-polygamia-neceſſaria claſs of plants, the compound flower of which is radiated, with a great number of tubuloſe and quinquedentated hermaphrodite ones on the diſc: the ſtamina are five very ſhort capillary filaments; and the ſeed, which is ſingle after each flower, is contained in the cup, and is either naked or crowned with down.

OTIS, the BUSTARD, in ornithology, makes a diſtinct genus of birds, of the order of the gallinæ, the characters of which are theſe: there are three toes on each foot, all turned forwards; and the head is naked, or has no comb.

The buſtard has been confounded with the turkey: it is about the ſize of the common peacock, and runs at a prodigious rate, being frequently taken with greyhounds in a fair courſe, in the manner of hunting the hare: its fleſh is well taſted.

OTLEY, a market-town, twenty-one miles weſt of York.

OTOQUE, an iſland ſituated in the bay of Panama, from whence this city is furniſhed with proviſions: weſt long. 82°, north lat. 7°.

OTRANTO, a city and archbiſhop's ſee of the kingdom of Naples, ſituated at the entrance of the gulph of Venice: eaſt long. 19° 15′, north lat. 40° 12′.

OTRICOLI, a town of Italy, thirty-five miles north of Rome.

OTTER, *lutra*, in zoology, a genus of quadrupeds, of the order of the feræ, the characters of which are theſe: the fore-teeth in the upper-jaw are ſtraight, diſtinct and acute; thoſe of the under jaw are obtuſe, and ſtand cloſe together: the ears are ſituated lower than the eyes, and the feet are furniſhed each with five toes, and are palmated or formed for ſwimming.

Of this genus there are two ſpecies: 1. The common otter, with all the toes of an equal length: this is a very fierce animal, three feet in length, including the tail. 2. The braſilian otter, with the inner toe ſhorter than the reſt. This is ſomewhat larger than the former ſpecies.

OTTER-HUNTING. See HUNTING.

OTTER-PIKE, in ichthyology, a ſpecies of trachinus, with the under jaw longeſt, and without any cirri, being otherwiſe called weaver. See TRACHINUS.

OTTOMAN, or OTHOMAN, an appellation given to the turkiſh empire, from Othomannus, or Oſmanhus, the firſt emperor of the preſent family.

OTTONA, or ORTONA, a city of the kingdom of Naples, ſituated on the gulph of Venice, in eaſt long. 15° 30′, north lat. 42° 22′.

OTUS, in ornithology, a name whereby ſome writers call the leſſer horn-owl. See the articles STRIX and OWL.

OVA, EGGS, in phyſiology, architecture, *&c.* See the article EGG.

For the ova of women, ſee EGG, FALLOPIAN, GENERATION, and OVARIES.

OVAL, an oblong curvilinear figure, otherwiſe called ellipſis. See ELLIPSIS. However, the proper oval, or egg-ſhape, differs conſiderably from that of the ellipſis, being an irregular figure, narrower at one end than at the other; whereas the ellipſis, or mathematical oval, is equally broad at each end: though, it muſt be owned, theſe two are commonly confounded together; even geometricians calling the oval a falſe ellipſis.

For oval columns and crowns, ſee the articles COLUMN and CROWN.

OVALE FORAMEN. See the articles FORAMEN and FOETUS.

OVARIES, in anatomy, called, by the earlier writers, teſtes muliebres, are two bodies of nearly an oval figure; but gibbous on the upper ſurface, and flat below;

low: they are of a whitish colour and smooth surface, and are annexed, one on each side, to the fundus of the womb. They are connected, 1. To the fundus uteri, by means of the ligamentum teres; 2. To the fallopian tubes, and the sides of the pelvis, by the ligamenta lata of the uterus, and the alæ vespertilionum; and 3. To many other parts by means of the spermatic vessels.

Their size differs, according to the age and temperament of the subject. They are largest in persons in the vigour of their age, and in such as are addicted to lust; in such subjects, they are found of two drams weight, and furnished with a number of prominent vesicles. In old people, they scarce weigh so much as half a dram, and are dry, corrugated, and deformed with cicatrices.

The ovaries are surrounded by a strong white membrane from the peritonæum, and are of a membranaceous substance, fibrous, reticulated, and full of vessels variously interwoven; among which are a number of round vesicles, with a yellow substance disposed under them: these are more or fewer in number, according to the age and temperament of the person; and are filled with a substance much resembling the white of an egg, which acquires also, on boiling, the hardness and consistence of a boiled egg. From this analogy with the eggs of birds, these vesicles were called, by Hornius, ova or ovula: the largest of them are hardly so big as a pea; but there are sometimes ten, sometimes fifteen, and at other times twenty, or more, in one ovary; though sometimes there are only one or two of them: these are supposed to contain the first rudiments of the fœtus. See the article FOETUS.

OVATION, in the roman antiquity, a lesser triumph, allowed to commanders for victories won without the effusion of much blood; or for defeating a mean and inconsiderable enemy. The show generally began at the Albanian mountain, whence the general with his retinue, made his entry into the city on foot, with many flutes or pipes sounding in concert as he passed along, and wearing a garland of myrtle as a token of peace. The term ovation, according to Servius, is derived from *ovis*, sheep, because on this occasion the conqueror sacrificed a sheep, as in triumph he sacrificed a bull.

OUDENARDE, a town of the Austrian Netherlands, in the province of Flanders, situated on the river Scheld, thirteen miles south of Ghent.

OUDENBURG, a town of the Austrian Netherlands, in the province of Flanders, five miles south-east of Ostend.

OVEN, a kind of domestic furnace, used for baking bread, pies, tarts, &c. of a circular structure, with a very low roof, well lined, both on the top, bottom, and sides, with stone; it has a small entrance in the front, which is exactly fitted by a kind of door, which being clapped to the mouth of the oven confines the heat, while bread, pies or puddings are baking. Over this, pastery-cooks, &c. have another oven built much in the same manner, which is used for such things as require a less degree of heat. Ovens are heated by burning dry wood, faggots, &c. in them, till all the parts are equally hot.

Assaying-OVEN, in metallurgy, a particular kind of furnace, used by assayers in their operations upon metals.

The assaying-oven is constructed in the following manner: make with iron-plates a hollow quadrangular prism, eleven inches broad and nine inches high, (as in plate CLXXXIX. fig. 4.) ending at top in a hollow quadrangular pyramid, *bb cc*, of seven inches in height, terminating in an aperture at top seven inches square. At the bottom it must be closed with another iron plate, which serves as a bottom to it: near the bottom make a door, *e*, three inches high and five broad, to lead to the ash-hole: above this door, and at the height of six inches from the basis, make another door *f*, of the figure of the segment of a circle: then fasten three long iron-plates on the fore-part of the furnace with rivets, one with its lower edge, as at *g g*, half an inch high; the second three inches high, as at *h h*; and the third, which is like the first, above the upper door at *i i*; and these plates are to be set on in such a manner as to form grooves: in order to shut both doors, you must adapt to each of them two sliders, *k k*, *l l*, made of iron-plates, to move within the abovementioned grooves, each of which should have a handle, but the two sliders belonging to the upper door, must have each a hole near the top; that is, one a small hole, a fifth of an inch broad, and an inch and a half long, as at *m*; and the other a semicircular aperture, one inch high and two inches broad,

broad, as at *n*: befides thefe, let five round holes, each of an inch in diameter, be bored in the furnace, two of which muft be in the fore-part, as at *o o*; two in the back-part, oppofite to the former, and all of them two inches and a half diftant from each of the fides; and a fifth hole, *p*, muft be made at the height of one inch above the upper edge of the upper door. The infide of the furnace muft be lined throughout with iron hooks, ftanding out above half an inch, and placed at about three inches diftance from each other, to hold on the matter of the lute, with which the whole inner furface is to be coated: let an iron, moveable, hollow, quadrangular pyramid, *q*, of three inches in height, be next adapted to the upper aperture of the furnace, fo as to flide into the grooves *c c*; it muft have two handles, as at *s s*, and be feven inches broad at the bafis, and end upwards in a hollow tube, *r*, three inches in diameter, two inches high, and nearly cylindrical, but a little convergent at the top: this tube ferves to fupport an iron-funnel or flue, *t*, which muft be nearly cylindrical, hollow, and two feet long: this, when a very ftrong fire is required, muft be put perpendicularly on the fhorter tube, in fuch a manner that the latter enters about an inch and a half clofely and evenly into it, and may be taken off at pleafure when the fire is not required to be fo very violent: let a fquare ledge, made of a thick iron-plate, be faftened at the top of the upper edge of the lower door, which will conveniently fupport the grate and the lute; but this ledge muft be made of two pieces, that it may be eafily introduced into the cavity of the furnace. You muft next place within the furnace fmall quadrangular iron-bars, half an inch thick, and faften them edgeways on the extremities of the ledge, three quarters of an inch diftant from each other. The infide of the furnace being then luted with windfor-loam, and dried by a gentle heat, will be fit for ufe.

The beft fuel for this furnace is charcoal made of hard wood, and broken into pieces about an inch big, which muft be introduced through the top of the furnace; and when an operation is performed, two iron-bars are to be put through the four holes above-mentioned, on which the muffle being introduced through the upper aperture, is placed in fuch a manner, as that the open forefide of it be contiguous to the inward border of the upper door.

OVER, in general, fignifies one thing being above another; through, or from, one end to another; beyond, crofs, or overthwart: it alfo denotes excefs, &c. thus,

OVER-BLOW, among feamen, is when the winds blow fo very hard, that the fhip can bear no topfails.

OVER-DONE, in the manege: a horfe is faid to be over-done when his wind and ftrength are broke and exhaufted with fatigue.

OVER-FLOWING *of lands*, among hufbandmen, is commonly effected by diverting the ftreams of rivers, brooks, land-floods, or fprings, or fome part of them, out of their natural channel: but where ftreams lie too low for this, they are made ufe of to turn fuch engines as may raife a fufficient quantity of water to do it. The moft ufeful engine for this purpofe is the perfian wheel. See the article PERSIAN WHEEL.

Where there are no ftreams to turn this wheel, the farmers have recourfe to pumps and other engines moved by the wind. Lands that lie low, near brooks, give more frequent opportunities for thefe practices than thofe which are near rivers; the brooks having greater falls, and the rivers running more flow and level: but when it can be effected by the waters of large rivers, the land is yet more enriched by it; thefe waters being much more fruitful than the others. When the water is by this engine thrown into the trough, it is to be conducted by it to the higheft part of the land; and when that is fufficiently flooded, the water is to be let into a large but not deep trench; feveral fmall ones running out of which to all parts of the land, may convey it every where, and every part may be enriched by it. It is always proper to contrive this matter fo, that the overflowing may be often repeated, and the water quickly carried off: for when it is fuffered to be long upon the land in winter, it is apt to breed rufhes, and other coarfe plants, upon the ground. All waters are not proper for this purpofe of overflowing of lands to enrich them: the waters of coal-mines, and other places where there is only fulphureous minerals mixed among them, being apt to deftroy and kill the grafs wherever they come. Land-floods are the beft to overflow with

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in winter, and warm fattening springs in summer. It must be observed, that the water of one operation is dried, before any more is let on. It is always best also to do it at night, that the moisture may be soaked into the ground before the heat of the day. The washings of towns, and of public highways, is a great improvement to lands; as is also the washings of lands where sheep feed. Cold clay lands, and other strong lands that lie flat will only be improved by overflowing them with land-floods, and that only in summer.

Over-grown, on board a ship. When the waves of the sea grow high, the mariners call it rough-sea; but when the surges and billows grow higher, then it is an over-grown sea.

Over-hale, in the sea-language. A rope is said to be overhaled when drawn too stiff, or haled the contrary way.

Over-hale *the runner*. See Runner.

Over-rake, among seamen: when a ship, riding at anchor, so overbeats herself into an head-sea, that she is washed by the waves breaking in upon her, they say the waves over-rake her.

Over-reach, in the manege, is when a horse strikes his hind-feet against his fore. The word is also used for a strain or painful swelling of the master-sinew of an horse, occasioned by such over-reach.

Over-riding, in the manege, the same with over-done, *supra*.

Over ruling *an objection*, in law, is the rejecting or setting it aside by the court.

Over-running, among printers. See the article Printing.

OVERSEERS *of the poor*, are public officers appointed by statute in every parish, to provide for the poor therein; and sometimes they are two, three, or four, according to the largeness of parishes. See the article Poor.

OVERSET, or Overthrow, in the sea-language. A ship is said to overset, when her keel turns uppermost; which misfortune is occasioned either by bearing too much sail, or by grounding her so that she fails upon one side.

OVERFLACKEE, an island of the united Netherlands, in the province of Holland, situated in the mouth of the river Maes, having the island of Voorn on the north, Brabant on the east, the island of Schowen on the south, and the Goree on the west.

OVERT, the same with open: thus an overt-act signifies an act which, in law, must be clearly proved; and such is to be alledged in every indictment for high treason.

OVERTURE, or Ouverture, opening or preluding; a term used for the solemnities at the beginning of a public act or ceremony; an opera, tragedy, concert of music, &c.

The overture of the theatre, or scene, is a piece of music usually ending with a fugue: the overture of a jubilee is a general procession, &c.

OVERYSCHE, a town of the Austrian Netherlands, in the province of Brabant, situated on the river Ysche, nine miles north-east of Brussels.

OVERYSSEL, one of the United Provinces, bounded by Groningen on the north, by Westphalia on the east, by Zutphen on the south, and by Guelderland, the Zuyder-sea, and Friesland on the west.

OVICULUM, in the antient architecture, a little ovum, or egg: some also use the word oviculum for ovolo. See Ovolo.

OVIEDA, in botany, a genus of the didynamia-angiospermia class of plants, the corolla whereof is a ringent single petal; the tube of the corolla is very long and small; the upper lip is concave and emarginated; the lower one is divided into three equal segments: the fruit is a globose berry, containing two roundish seeds.

OVIEDO, a city of Spain, capital of the province of Asturias: situated on the river Asta, fifty miles north of Leon, in west long. 6° 40′, north lat. 43° 30′.

OVILIA, or Septa, in antient Rome, a place in the campus martius, at first railed in like a sheep-pen, whence its name. Afterwards it was mounted with marble, and beautified with walks and galleries, as also with a tribunal, or seat of justice. Within this precinct, or enclosure, the people were called in to give their suffrages for the election of magistrates. The ascent into the ovilia was not by stairs, but by pontes, or narrow boards, laid there for the occasion; on which account *de ponte dejici* was to be denied the privilege of voting; and persons thus dealt with, were called depontani.

OVIPAROUS, a term applied to such animals as bring forth their young, *ab ovo*, from eggs; as birds, insects, &c. See the article Egg.

The oviparous kind stand in opposition to those which bring forth their young alive, called viviparous animals, as man,

man, quadrupeds, &c. Oviparous animals may be ſaid to be ſuch as conceive eggs which they afterwards bring forth, and from which, by the incubation of the parent, or ſome other principle of warmth and fermentation, at length ariſe animals; which, after they have ſpent the moiſture or humour they have been ſurrounded withal, and are grown to a ſufficient bulk, firmneſs and ſtrength, break their ſhell and come forth. The oviparous kind, beſides birds, include divers other ſpecies of terreſtrial animals.

OVIS, the SHEEP, in zoology. See the article SHEEP.

OULNEY, a market-town of Buckinghamſhire, ſituated nine miles ſouth-eaſt of Northampton.

OULZ, a town of Italy, in the province of Piedmont, ſituated in eaſt long. 6° 30', north lat. 45°.

OUNCE, *uncia*, a little weight, the ſixteenth part of a pound-avoirdupois, and the twelfth part of a pound-troy: the ounce-avoirdupois is divided into eight drams, and the ounce-troy into twenty penny-weights. See WEIGHT.

OUNCE, *lynx*, in zoology. See the article LYNX.

OUNDLE, a market-town of Northamptonſhire, ſituated on the river Nen, twenty-two miles north eaſt of Northampton.

OVOLO, or OVUM, in architecture, a round moulding, whoſe profile, or ſweep, in the ionic and compoſite capitals, is uſually a quadrant of a circle: whence it is alſo commonly called the quarter round. It was uſually enriched with ſculpture by the antients, in the form of cheſnut-ſhells; whence Vitruvius, and others, called it echinus, *i. e.* cheſnut-ſhell. See the article MOULDING.

Among us, it is uſually cut with the repreſentation of eggs and anchors, or arrows-heads placed alternately.

OURAN, the name of an imaginary ſect of magicians, in the iſland of Gromboccanore, in the Eaſt-Indies; where they are ſuppoſed to have the art of rendering themſelves inviſible, and paſſing where they pleaſe, and by theſe means doing infinite miſchief.

OUROLOGY, in medicine, a name given by authors to a treatiſe or diſcourſe on the ſubject of urine. See the article URINE.

OUSE, a river, which riſing in the north of Yorkſhire, runs ſouth-eaſt by York; and, continuing that courſe, falls into the Trent.

OUSE is alſo a river which riſes on the confines of Oxfordſhire and Buckinghamſhire, and running north-eaſt through Buckinghamſhire, Bedfordſhire, Huntingdonſhire, Cambridgeſhire, and Norfolk, paſſes by Buckingham, Bedford, Huntingdon, and Ely, diſcharging itſelf into the bay of the German ſea at Lynn.

OUSTED, in our old law-books, the being removed or put out of poſſeſſion.

OUSTER LE MAIN, a writ antiently granted and directed to the eſcheator, on a petition for the ſame purpoſe, to deliver ſeiſin out of the king's hand to the party who ſued out the writ, becauſe the lands ſeiſed were not held of the king; or that he ought not to have the wardſhip of them, &c. It is likewiſe taken to be the judgment given in a monſtrans de droit: but all ouſter le mains, wardſhips, liveries, &c. are now taken away.

OUSTER LE MER, in law, ſignifies a cauſe of excuſe given to the court on a defendant's not appearing upon ſummons, by alledging that he was then beyond the ſeas.

OUSTIACH, or OSTIACH *country*, is a part of Aſiatic Ruſſia, extending along the river Irtis to its confluence with the river Oby, and from thence northward along the banks of the Oby and Jeniſa, into the gulph of the Manga-ſea, or the frozen ocean; and extending alſo along the banks of ſeveral rivers which fall into the Oby and Jeniſa.

OUTFANGTHEF is taken for an antient privilege of the lord, when a felon, dwelling in his manor, was taken out of his fee; in which caſe, he might cauſe him to be brought back to judgment in his own court.

OUT-HOUSES are ſuch as belong and are adjoining to dwelling-houſes.

OUT-LAND, among the Saxons, was that land which lay beyond the demeſnes, and was granted out to tenants; though at the will of the lord, in like manner as copyhold eſtates.

OUT-LAW, ſignifies one that is deprived of the benefit of the law, and therefore held to be out of the king's protection. See the next article.

Where an original writ, and the writs of capias, alias, and pluries, have been iſſued againſt a perſon, and are returned by the ſheriff, non eſt inventus, and after proclamation made for him to appear,

&c. if he omits so doing, he then becomes out-lawed: though, formerly, no person could be out-lawed, except in the case of felony; which being punishable by death, any person was at liberty to slay the out-law; but that is now altered, and no person but the sheriff, on a lawful warrant, may put a person out-lawed for felony to death. An infant under age, or a woman who is never sworn to allegiance, cannot be an out-law, though the latter is said to be waived. See the article WAIVE.

OUTLAWRY, is where a person is out-lawed, and on that account loses the benefit of a subject. See the preceding article.

The process of outlawry lies in indictments of treason or felony, and also of trespass vi & armis, conspiracy, &c. And by statute, persons may be out-lawed in many civil actions, as debt, case, covenant, &c. On an outlawry for felony the person forfeits his lands, goods, and chattels; in personal actions, the goods and chattels of the person are only liable, and they are forfeited to the king, with the profits of his chattels real, by a necessary consequence, that the party being extra legem, is therefore incapable to take them himself. In the case of either treason or felony, an outlawry may be reversed by writ of error, or plea; and the judgment upon the reversal is, that the party shall be restored to all that he lost, &c. however, he must plead to the indictment against him. If a party out-lawed in a civil cause, does come in gratis, on the return of the exigent, alias, or pluries, he may, by motion, reverse the outlawry, without putting in of bail: but in case he comes in upon a cepi corpus, he shall not be permitted to do it, unless he appear in person, or give bail to the sheriff for his appearance on the return of the cepi. When an outlawry is after judgment, it cannot be reversed, till satisfaction is acknowledged of record by the plaintiff, or the defendant has brought the money recovered into court: and on reversal of an outlawry, the plaintiff may declare against the defendant for the same matter, in two terms, on a new original, and in another county, besides that wherein the action was first laid.

OUTLICKER, in a ship, a small piece of timber made fast to the top of the poop, and standing out right a-stern. At the outmost end thereof is a hole, into which the standing part of the sheet is reeved, through the block of the sheet; and then again through another block, which is seized close by the end of this outlicker. It is seldom used in great ships, except the mizen-mast is placed so far aft, that there is not room within-board to hale the sheet flat.

OUT-RIDERS, certain bailiffs-errant, that are employed by sheriffs, to ride to the farthermost parts of counties, or hundreds, in order to summon people more speedily to county courts, &c.

OUTWARD *flanking angle*, or *The angle of the tenaille*, in fortification, is comprehended by the two flanking lines of defence.

OUTWORKS, in fortification, all those works made without-side the ditch of a fortified place, to cover and defend it.

Outworks, called also advanced and detached works, are those which not only serve to cover the body of the place, but also to keep the enemy at a distance, and prevent his taking advantage of the cavities and elevations usually found in the places about the counterscarp, which might serve them either as lodgments, or as rideaux, to facilitate the carrying on their trenches, and planting their batteries against the place: such are ravelines, tenailles, hornworks, queve d'arondes, envelopes, crown-works, &c. See the article RAVELIN, TENAILLE, &c.

It is a general rule in all outworks, that if there be several of them, one before another, to cover one and the same tenaille of a place, the nearer ones must gradually, one after another, command those that are farther advanced out into the champaign, that is, must have higher ramparts, that so they may overlook and fire upon the besiegers, when they are masters of the more outward works.

OUVERTURE. See OVERTURE.

OVUM PHILOSOPHICUM, or CHEMICUM, a glass-body, of an oval form, resembling an egg, used for the sublimation of mercury. See MERCURY.

OUZEL, or the *Water* OUZEL, in ornithology, the motacilla, with a black body and white breast. See MOTACILLA.

OWELTY, or OVELTY *of services*, in our law-books, denotes an equality of services; as in the case of a lord-mesne, and a tenant who holds the mesne, as he holds of the superior lord.

OWL, in ornithology, the english name of several species of the strix. See STRIX.

The several species of strix, that fall under this denomination, are very numerous.

merous. 1. For the great horn-owl, or eagle-owl, see the article Bubo. 2. The black and white horn-owl, or the white aurited strix, is a beautiful bird, equal to a turkey in size, of a snow-white colour, elegantly variegated with spots and lines of black; the head is large, round, short, and decorated in a very beautiful manner, with a pair of ears or horns, as they are usually called, being tufts of erect feathers, having their origin from the verges of the apertures of the ears. 3. The lesser horn-owl, being the strix with the head aurited with six feathers, is another very beautiful bird, equal to a large pigeon in size, with very large wings; the wings are reddish, as is also the lower part of the belly and back. 4. The grey-owl, or the brown strix, with a smooth head, with black eyes, and the primary wing-feathers serrated. 5. The yellow owl, with a smooth head. 6. The hazel-owl, or the brown strix, with a smooth head, and the eyes brown. 7. The yellow-eyed owl, or the brown smooth-headed strix, with the iris of the eyes yellow. 8. The variegated tailed owl, or the brown smooth-headed strix, spotted with white, and with white fasciæ on the tail. 9. The little owl, or the brown strix, with a smooth head, and five series of spots on the wing feathers. This is an extremely pretty little bird, and so small, that it appears singular to see the marks of this genus on it. It is about the bigness of the black-bird, and its wings are very long. 10. The white-owl, or the white strix, with a smooth head, being nearly equal to a goose in bigness. 11. The common brown-owl, or jay-owl, being the brown smooth-headed strix, with the third of the wing-feathers longest, and about the size of a pigeon. 12. The german horn-owl, or the horn-owl with a long tail. 13. The church-owl, or the lesser horn-owl, being the variegated-backed, smooth headed strix. 14. The white-beaked owl, or the smooth-headed strix, with a bluish, grey back, and a whitish beak. And, 16. The yellow-beaked american owl, or the yellow-beaked strix, with a brown body, variegated with white.

OWLER, any person who conveys wool, &c. to the sea-side in the night time, there to be shipped, contrary to law.

OWSE, among tanners, oaken bark beaten or ground small, to serve in the preparation of leather.

OX, *bos*, in zoology, makes a genus of quadrupeds. See the article Bos.

The common ox is too well known to need a particular description: the bull is a very heavy, but at the same time a stately and fierce-looking animal, with wide nostrils, large eyes, and long and patulous ears; his forehead is decorated with short curled hair, and the skin hangs loose under his throat: for the properties of a bull, kept for breeding, see the article Bull.

When these creatures are intended to breed, the better the land is, the larger sort of beasts is to be chosen, and the greater will be the profit. But of whatever sort the breed is, the bull should always be of the same country with the cow, otherwise it never succeeds so well. See the article Cow.

The largest oxen are to be chosen for work, and for feeding, but then it must be where there is land rich enough to maintain them. When they are to draw, care must be taken to match them well, both for height and strength; for if one be stronger than the other, the weakest will soon be destroyed. They must never be driven beyond their natural pace, for the beating them throws them into surfeits, and many other diseases. The time of putting oxen to work is at three years old; they must be worked gently the first year, especially in hot weather, and fed with a large quantity of hay: this will enable them to bear their labour better than grass; and they should be always kept in a middle state, neither too fat nor too lean. They may be worked till they are ten or twelve years old, and then sold.

Diseases of Oxen. As scarce any creature is more useful to man than the ox kind, nothing is more worthy consideration than the nature and origin of their diseases, and the remedies for them. The same distemper that has of late years carried off such vast numbers of these cattle with us and elsewhere, has at other times raged in Italy. In the year 1710, and the succeeding one, there was a great mortality among the horned cattle there, and the occasion of it was evidently the unnatural season preceding. The whole autumn before had been wet, and at the time of the winter solstice there were continual cold winds, and small, but lasting rains. The spring that succeeded was also cold and rainy, and the defect of heat, and abundance of moisture, made

a change in the whole face of nature: the medicinal ſprings had not their wonted effect; and the fruits of the earth could not appear at their proper ſeaſons, nor in their due perfection. The graſs was injured by this, and the ground rendered continually damp and unwholeſome: and to this was evidently owing the malignant and contagious diſeaſe that raged among the cattle afterwards. It was ſuppoſed at that time with them, as of late with us and elſewhere, that the contagion was brought in among their oxen by ſtrange cattle coming from infected places, but this proved to be an error; for if an ox was removed to ever ſo diſtant a paſture, he never eſcaped the better for it: the whole earth and its productions were vitiated throughout the country, and there was no ſafety in any part of it.

The uſe of this obſervation muſt be, the keeping the cattle in ſucceeding years out of the way of thoſe things which occaſion their ſickneſſes in ſuch as theſe. If the autumn or winter be extremely cold and wet, remove the cattle out of the low grounds, and put them to feed in ſandy, dry ſoils, on the high grounds; give them water from ſuch places where the ſun has moſt power, and it is leſs chilling cold than in others; and in caſes of imminent danger, always mix ſome ſalt in it. If the bad weather continues, let them always have clean ſtraw to lie on, and a dry covering; and in caſes where the contagion is already begun, the fumigating the houſes where they are kept with bay leaves and eleutherian bark, is judged convenient. As to remedies, when they are once ſeized with the diſtemper, it is hard to underſtand what intention to preſcribe in, and how to aſcertain the doſes; and as the late practice, in attempting to cure, has been of very little ſervice, the cautions for preventing the diſeaſe ought to be redoubled, to avoid an almoſt incurable misfortune.

OXALIS, or OXYS, WOOD SORREL. See the article *Wood* SORREL.

OXFILD, in our old writers, is ſaid to be a reſtitution made by a county, &c. for any wrong done in the ſame. See the article HUE and CRY.

OXFORD, the capital city of Oxfordſhire, and the ſee of a biſhop; it is ſituated at the confluence of the Iſis and Cherwell, fifty-five miles weſt of London: weſt long. 1° 15′, and north lat. 51° 45′. Oxford is moſt remarkable on account of its univerſity, which conſiſts of twenty colleges and five halls: this city ſends two members to parliament, and the univerſity as many.

OXGANG, or OXGATE, is generally taken, in our old law-books, for fifteen acres, or as much ground as a ſingle ox can plough in a year.

OXUCIÆ, in natural hiſtory, the name of a genus of foſſils of the claſs of the ſelenitæ, but of the columnar, not the rhomboidal kind. The ſelenitæ of this genus conſiſt of ſix equal planes, having their top or bottom no broader or more depreſſed than the others; and in this differing from the iſchnamblucæs, or flatted columnar ſelenitæ, as they do from the iſamblucæs or cryſtaliform, but broken ended ones, by having their ends naturally tapering off to a point. The bodies of this genus, like thoſe of the other genera of the columnar ſelenitæ, are liable to a longitudinal crack in their middle; and this ſometimes includes a little clay, in form of an ear of graſs. See the article SELENITÆ.

Of this genus there are only two known ſpecies. 1. A fine kind, with thin flakes and tranſverſe filaments, found in the clayey banks of the river Nen, near Peterborough, in Northamptonſhire; and, 2. A dull kind, with thick plates and longitudinal filaments. This is not uncommon in Yorkſhire, and lies ſometimes in a yellow, ſometimes in a blue clay.

OXUS, a river which riſes in the mountains on the north of India, and running northweſt, through Uſbec Tartary, afterwards ſeparates Perſia from Uſbec Tartary, and falls into the Caſpian ſea, in 44° north latitude.

OXYCOCCUS, in botany, a ſpecies of vaccinium. See VACCINIUM.

OXYCRATE, *oxycratum*, in pharmacy, &c. a mixture of vinegar and water, proper to aſſwage, cool, and refreſh: they make fomentations of oxycrate, clyſters of oxycrate, &c. The uſual proportion is one ſpoonful of vinegar to five or ſix ſpoonfuls of water.

OXYCROCEUM, in pharmacy, &c. a preparation much uſed in plaſters for fractures, &c. made as follows: take yellow wax, one pound; pitch and galbanum, each half a pound: melt them over a gentle fire; and then add of venice-turpentine, myrrh, and olibanum, each three ounces; ſaffron, two ounces: make them into a plaſter.

OXYGLYCU, a ſpecies of drink prepared of the ſweeteſt honey-combs, macerated and boiled. The combs from which all the honey has been expreſſed, are put into a pot with pure water, and boiled till they ſeem to have depoſited all their contained honey in the water. This liquor is to be kept, and, when diluted with cold water, is to be drank in the ſummer-time, in order to remove thirſt.

OXYMEL, in pharmacy, a compoſition of vinegar and honey.

There are ſeveral ſorts of oxymel, whereof the ſimple kind is made by boiling, in a glazed earthen-veſſel, and with a gentle fire, two pounds of clarified honey, in a pint of vinegar, to the conſiſtence of a ſyrup.

The chief compound oxymels, are oxymel of garlic, and oxymel of ſquills.

Oxymel of garlic is thus made: take of garlic, ſliced, an ounce and an half; caraway-ſeeds, and ſweet-fennel-ſeeds, of each two drams; of clarified honey, ten ounces; of vinegar, half a pint: boil the vinegar a little while in a glazed earthen-veſſel, with the ſeeds bruiſed; then add the garlic, and cover the veſſel; after all is cold, preſs out the liquor; and, with the heat of a balneum, diſſolve in it the honey.

Oxymel of ſquills is made by boiling three pounds of clarified honey in a quart of vinegar of ſquills, over a gentle fire, to the conſiſtence of a ſyrup.

In all the oxymels, a metalline veſſel muſt be avoided, leſt it ſhould be corroded by the vinegar.

OXYRRHODIUM, in pharmacy, a compound medicine, made of four or five parts of oil of roſes, and one of vinegar.

It is uſed in inflammations, and to dry up tetters.

OXYSACCHARUM, a liquid medicine prepared of ſugar and vinegar.

OYER, in law-books, ſeems to have been antiently uſed for what is now called aſſiſes. See the article ASSISE.

OYER AND TERMINER, a commiſſion directed to the judge of aſſiſe, and other gentlemen, impowering them to hear and determine all criminal cauſes, and to try all offenders, whether for treaſon, felony, or treſpaſs.

On the general commiſſion of oyer and terminer, there goes a precept to the ſheriff, in the name of the juſtices, bearing date fifteen days before their ſeſſions, in order to return twenty-four perſons, for a grand-jury, on ſuch a day. See JURY. Theſe juſtices have power to proceed only upon indictments that are brought before them, unleſs they have likewiſe a commiſſion of gaol-delivery, or a ſpecial one; which, it is ſaid, may be granted to enquire of oppreſſions and extortions of under-ſheriffs, bailiffs, clerks of the market, and all other officers, on the complaint of any one who will ſue out the ſame.

OYER *of a deed*, a petition to hear and peruſe any deed, upon which an action is brought. This is always granted the defendant, who may alſo take a copy of it, that he may conſider what to plead to the action. It is held, that where executors bring an action of debt, the defendant may crave oyer of the will.

There is alſo oyer of a record, wherein the plaintiff or defendant moves the court, that they will hear or look upon a record.

OYES, or OYEZ, ſignifies *hear ye*; and is frequently uſed by the cryers in our courts, on making proclamations, or to enjoin ſilence.

OYSTER, or OISTER, *oſtrea*, in zoology, a genus of bivalve ſhell-fiſh, the lower valve of which is hollowed on the inſide, and gibboſe without; the upper one is more flat; and both are compoſed of a multitude of laminæ or cruſts, and uſually ſcabrous or rough on the outer ſurface: ſome oyſter-ſhells are alſo furniſhed with tubercles, or ſpines, and others are deeply furrowed and plicated: the figure of moſt is roundiſh, but in ſome it is quite irregular.

Oyſter-ſhells are accounted drying and abſtergent, and given internally, ſudorific.

OZÆNA, ὄζαινα, in ſurgery, a foul and malignant ulcer of the noſe, diſtinguiſhed by its fœtor, and often accompanied with a caries of the bones of the noſe.

An ozæna generally proceeds from a foulneſs of the blood, and eſpecially when it is affected with the ſcurvy or venereal diſeaſe; tho' ſometimes it proceeds from acrimonious or cauſtic ſubſtances drawn into the noſe along with the breath.

As to the cure, ſuch medicines ſhould be uſed, as ſerve to correct the blood, and rectify the depraved habit of body; of which mercurials, and decoctions of the woods, are the chief; and in the mean time the patient's diet ſhould be ſpare and light,

ſight, and without ſeaſoning; and, when owing to a venereal cauſe, nothing proves ſo effectual as a ſalivation.

Externally, ſuch topical medicines muſt be applied as ſerve to deterge ulcers, as the aqua virid. Hartmanni, applied with tents or linen-rags rolled up. A mixture of lime-water with mercurius dulcis may be likewiſe uſed with ſucceſs. You will alſo find great benefit in the worſt kind of the diſorder, from a decoction of ſavin and ſcordium, in a pound of which muſt be diſſolved an ounce of the unguent. fuſc. Wurtz. uſed warm; or an injection of ſpirit of wine, in which is diſſolved ſome honey of roſes and mercurial ointment. Some uſe an injection of oil of ſweet almonds, an ounce, with a dram of oil of caſtor, to ſoften the acrimony of the humours; others, again recommend tobacco-leaves, or tobacco-ointment; and others uſe precipitate, mixed with an emollient ointment, and applied with tents: if the pain be great, they add to theſe medicines, a ſcruple of camphor and ſaffron, with half a ſcruple of opium. Laſtly, fumigating with cinnabar is recommended; in the uſe of which medicines, the patient muſt continue, at leaſt, till the ſtench and diſcharge of corrupt matter ceaſe. When the matter is well digeſted, the running abated, and the pain gone, the ulcer may be cicatrized with lotions, and waſhed with warm milk. If it gathers to a cruſt, it may be removed by oil of ſweet almonds, or by a powder made of roſemary and lavender-flowers, dried-lemon-peel, and common ſnuff.

When the ozæna is accompanied with a caries, it is hardly curable, before a ſeparation of the carious bone is obtained, which may ſometimes be effected by pliers, or a pair of ſciſſars.

Sometimes the ozæna is ſituated in the ſinus of the upper jaw; in which caſe Dr. Drake adviſes to extract one of the dentes molares, and then to open a paſſage through the alveolus or ſocket, into the ſinus, by a probe or other ſharp-pointed inſtrument: by this opening the offending matter may not only be diſcharged, but you may throw in proper injections, compoſed of elixir proprietatis, or tincture of myrrh and aloes, either alone, or mixed with a decoction of ſavin and ſcordium, with ſome honey of roſes; which muſt be retained in the ſinus for ſome time, by ſtopping up the paſſage: then, after the injection is diſcharged, a tent, tied to a thread, is to be inſerted, to prevent the paſſage from cloſing up, before the ulcer is thoroughly deterged; after which, the cure may be completed with balſamics.

P.

P or p, the fifteenth letter, and eleventh conſonant of the alphabet; the ſound of which is formed by expreſſing the breath ſomewhat more ſuddenly than in forming the ſound of b: in other reſpects, theſe two ſounds are very much alike, and are often confounded one with another. When *p* ſtands before *t* or *ſ*, its ſound is loſt, as in the words *pſalms, pſychology, ptolemaic, ptiſan*, &c. when placed before *h*, they both together have the ſound of *f*, as in *philoſophy, phyſic*, &c.

As an abbreviature, P ſtands for Publius, pondo, &c. PA. DIG. for patricia dignatis; P. C. for patres conſcripti; P. F. for Publii filius; P. P. for propoſitum, or propoſitum publice; P. R. for populus romanus; PR. S. for prætoris ſententia; and PRS. P. for præſes provinciæ.

In the italian muſic, P. ſtands for piano, or ſoftly; PP. for piu piano, *i. e.* more ſoftly; and PPP. for pianiſſimo, or very ſoftly.

Among aſtronomers, P. M. is uſed to denote poſt meridiem, or afternoon; and ſometimes for poſt mane, *i. e.* after midnight.

As a numeral, P. ſignifies the ſame as G. *viz.* 400; and with a daſh over it, thus $\overline{\text{P}}$, 400,000.

Among phyſicians, P. denotes pugil, or the eight part of an handful; P. Æ. partes æquales, or equal parts of the ingredients; P. P. ſignifies pulvis patrum, *i. e.*

i. e. the jesuits-powder; and ppt. præparatus, prepared.

PABULUM, FUEL, among natural philosophers and chemists. See the articles FUEL and FIRE.

PACALIA, a festival observed by the Romans, in honour of the goddess Pax, or Peace.

PACAMORES, a province of Peru, on the confines of Amazonia.

PACE, *passus*, a measure taken from the space between the two feet of a man, in walking; usually reckoned two feet and an half, and in some men a yard or three feet. See the article MEASURE.

The geometrical pace is five feet; and 60000 such paces make one degree of the equator. See the article DEGREE.

PACE, in the manege, is of three kinds, *viz.* walk, trot, and gallop; to which may be added an amble, because some horses have it naturally. See the articles WALK, TROT, *&c.*

Horses which go shuffling or mixed paces, between the walk and amble, are for the most part of no value; which commonly proceeds from their fiery temper, and sometimes from a weakness in their reins or legs.

PACHAMAC, a temple of Peru, in South America, dedicated by the Indians to the supreme being: it gives its name to the adjacent country.

PACHODECARHOMBIS, in natural history, the name of a genus of fossils, of the class of the selenitæ, expressing a thick rhomboidal body, composed of ten planes. See the article SELENITÆ.

The characters of this genus are, that the selenitæ of it consist of ten planes; but as the top and bottom in the leptodecarhombes, or most common kind of the selenitæ, are broader and larger planes than any of the rest, the great thickness of this genus, on the contrary, make its four longer planes in all the bodies of it, meeting in an obtuse angle from its sides, its largest planes. Of this genus there are only four known species. 1. A very pellucid one, with slender transverse striæ. This is frequent in the clay-pits of Northamptonshire, and some other countries; and the common people have an opinion, that it is good to stop hæmorrhages; whence it has acquired among them the common name of staunch. 2. A dull-looking kind, with very fine transverse filaments. This is found in the clay-pits of Northamptonshire, Staffordshire, and Yorkshire. 3. A fine and beautiful kind, with very slender longitudinal filaments. This is common in Yorkshire, and seems almost peculiar to that country; it is not only found there in digging, but frequently lies on the surface of the earth. And, 4. A brown pellucid kind, found very frequently in Germany, and sometimes in England.

PASCHU, an island in the Mediterranean, near the coast of Epirus, in european Turky, subject to Venice: east long. 20° 45′, and north lat. 39° 15′.

PACIFIC OCEAN, or SOUTH-SEA, that vast ocean which separates Asia from America: it is called Pacific, from the moderate weather the first mariners who sailed in it, met with between the tropics; and it was called South-sea, because the Spaniards crossed the isthmus of Darien from north to south, when they first discovered it: though it is properly the Western ocean, with regard to America.

PACIFIC LETTERS. See the article *Pacific* LETTERS.

PACIFICATION, in matters of polity, signifies the restoring of the public tranquility. Hence,

PACIFICATOR signifies much the same with mediator, or one who endeavours to reconcile princes or states at variance. See the articles PEACE and TREATY.

PACK, in commerce, denotes a quantity of goods, made up in loads, or bales, for carriage.

A pack of wool is seventeen stone and two pounds, or a horse's load.

PACKAGE, is a small duty of one penny in the pound, paid for all goods not particularly rated.

PACKERS, persons whose employment it is to pack up all goods intended for exportation; which they do for the great trading companies and merchants of London, and are answerable if the goods receive any damage through bad package.

PACOS, in zoology, a species of peruvian camel, without any gibbosity, erroneously reckoned by some a sheep: it is only three feet and an half high, from the ground to the top of the back; but the neck is very long, so that when the head is carried erect it is pretty tall. See the article CAMEL.

Like the glama, it is sometimes employed in carrying burdens: its flesh is very well tasted.

PACT, or PACTION, *pactum*, in law, denotes a contract, or agreement, between two or more parties. See CONTRACT.

PACTA CONVENTA, in Poland, are the articles agreed on between the king and the republic, which they mutually oblige each other to obſerve.

PACTOLUS, a river of Lydia, in the leſſer Aſia, celebrated by the antient poets for its golden ſands.

PADANG, a port-town on the weſt coaſt of the iſland of Sumatra, in the Eaſt-Indies, in poſſeſſion of the Dutch : eaſt long. 99°, ſouth lat. 1° 5′.

PADDLE, in glaſs-making, an inſtrument with which the workmen ſtir about the ſand and aſhes in the calcar. See the articles CALCAR and GLASS.

PADDOC, or PADDOC-COURSE, a piece of ground encompaſſed with pales or a wall, and taken out of a park for exhibiting races with grey-hounds, for plates, wagers, or the like.

A paddoc is generally a mile long, and a quarter of a mile broad; at one end a little houſe where the dogs are to be entered, and whence they are ſlipped; near which are pens to incloſe two or three deer for the ſport. Along the courſe are ſeveral poſts, *viz.* the low poſt, which is an hundred and ſixty yards from the dog-houſe and pens; the quarter of a mile poſt, half mile poſt, and pinching poſt; beſides the ditch, which is a place made to receive the deer, and preſerve them from farther purſuit. And near this place are ſeats for the judges choſen to decide the wager.

The keepers, in order to ſlip the dogs fairly, put a falling collar upon each, ſlipped through a ring, and the deer being turned looſe, and put forward by a teazer, as ſoon as he is arrived at the law poſt, the dog-houſe door is thrown open, and the dogs ſlipped. If now the deer ſwerve ſo much, as that his head is judged nearer the dog-houſe than the ditch before he arrive at the pinching-poſt, it is no match, and muſt be run over again three days after; but if the deer runs ſtraight beyond the pinching-poſt, then that dog that is neareſt when he ſwerves, or is blanched by any accident, wins the match; but if no ſuch ſwerve happens, then the match is won by the dog who firſt leaps the ditch.

PADERBORN, the capital of the biſhopric of the ſame name in Weſtphalia : eaſt long. 8° 25′, north lat. 51° 45′.

PADRON, a town of Spain, in the province of Galicia, fifteen miles ſouth of Compoſtella.

PADSTOW, a market-town of Cornwall, thirty miles weſt of Launceſton.

PADUA, the capital of the Paduan, in Italy, a city of a circular form, ſituated twenty-two miles weſt of Venice : eaſt long. 12° 15′, north lat. 45° 30′.

PADUAN, a province of Italy, in the territories of Venice, thirty-five miles long, and almoſt as much in breadth; bounded by the Treviſane, on the north: by the dutchy of Venice on the eaſt; by the Poleſin de Rovigo, on the ſouth; and by the Vicentin, on the weſt.

PADUAN, amongſt the medaliſts, a modern medal ſtruck in imitation of the antique; or a new medal ſtruck with all the marks and characters of antiquity. This name is properly applicable to thoſe medals only that were ſtruck, in the ſeventh century, by an italian painter, born at Padua; who ſucceeded ſo well in the impoſture, that the beſt judges are at a loſs to diſtinguiſh his medals from the genuine ones. Though it is frequently uſed in general for all medals of this kind.

PADUS, the LAUREL, or BIRD'S CHERRY, in botany, a ſpecies of prunus. See the article PRUNUS.

The fruit of this plant is recommended to be hung about the neck of children ſubject to epilepſies. It is of an emollient, and heating nature.

PÆAN, among the antient pagans, was a ſong of rejoicing ſung in honour of Apollo, chiefly uſed on occaſions of victory and triumph.

PÆAN, in the antient poetry, a foot conſiſting of four ſyllables; of which there are four kinds, the pæan primus, ſecundus, *&c.* See the article FOOT.

The pæan primus conſiſts of one long ſyllable and three ſhort ones, or a trochæus and a pyrrhichius, as *temporibus*; the pæan ſecundus conſiſts of a ſhort ſyllable, a long, and two ſhort, or an iambus and a pyrrhichius, as *potentia*; the pæan tertius conſiſts of two ſhort ſyllables, a long and a ſhort one, or a pyrrhichius and a trochæus, as *animatus*; the pæan quartus conſiſts of three ſhort ſyllables and a long one, or a pyrrhichius and iambus, as *celeritas*.

PÆDAGOGUE, or PEDAGOGUE. See the article PEDAGOGUE.

PÆDARTHROCACES, in ſurgery, a diſeaſe of the bones, raiſing them into tumours near the joints, and differing from the ſpina ventoſa, in that it is not attended either with violent pains or eroſion of the bone and adjacent parts. See the article SPINA VENTOSA.

This

This disease is most frequently found in the joints of children: for as the bones of children are more soft and spongy than the bones of adults and old persons, they are so much the easier distended by humours, and more frequently form tumours. See CARIES and EXOSTOSIS.

PÆDEROTA, in botany, a genus of the diandria-monogynia class of plants, the corolla whereof consists of a single petal; the tube is cylindric, and of the length of the cup; the limb is formed as it were into two labia; the upper lip is oblong, hollow, and narrow; the lower lip is broader, and is divided into three equal segments at the extremity: the fruit is an oval capsule, compressed at the top, and bifid, composed of four valves, and containing two cells, in each whereof there are numerous, obtuse, oblong seeds, which adhere to a columnar receptacle.

PÆDO-BAPTISM, infant-baptism, or that conferred on children. See BAPTISM.

PÆONIA, PIONY, in botany, a genus of the polyandria-digynia class of plants, the corolla whereof consists of five roundish, concave petals, very large, patent, and narrow towards the base: the fruit consists of two capsules, reflexo-patent, of an oblong, oval figure, hairy, containing each one cell, formed each of a single valve, and opening longitudinally inwards: the seeds are numerous, oval, smooth, beautiful, and coloured. The number of the germina, though naturally two, varies greatly: in some flowers there are five.

The root of this plant is a very celebrated medicine in nervous cases. We have instances well attested of epilepsies being solely cured by it. It is good also in all disorders of the head, and in hysteric complaints: it promotes the menses, and removes obstructions of the viscera.

PAGAN, *paganus*, a heathen, gentile, or idolater; one who adores false gods. See the article PAGANISM.

PAGANALIA, certain festivals observed by the antient Romans in the month of January. They were instituted by Servius Tullius, who appointed a certain number of villages (pagi), in each of which an altar was to be raised for annual sacrifices to their tutelar gods; at which all the inhabitants were to assist, and give presents in money, according to their sex and age, by which means the number of country-people was known. The servants upon this occasion offered cakes to Ceres and Tellus, to obtain plentiful harvests.

PAGANELLUS, in ichthyology, the name of a fish of the sea-gudgeon or rock-fish kind, called by authors gobius marinus. See the article GOBIUS.

This fish has a yellow tranverse line on the top of the first back-fin. It grows to about six inches in length, and is thick in proportion.

PAGANISM, the religious worship and discipline of pagans; or, the adoration of idols and false gods. See IDOLATRY.

The gods of paganism were either men, as Jupiter, Hercules, Bacchus, &c. or fictitious persons, as Victory, Fame, Fever, &c. or beasts, as in Egypt, Crocodiles, Cats, &c. or, finally, inanimate things, as Onions, Fire, Water, &c.

PAGE, a youth of state retained in the family of a prince or great personage, as an honourable servant, to attend in visits of ceremony, do messages, bear up trains, robes, &c. and at the same time to have a genteel education, and learn his exercises. The pages in the king's houshold are various, and have various offices assigned them, as pages of honour, pages of the presence chamber, pages of the back stairs, &c.

This word is used in the turkish seraglio for the children of tribute, or slaves who wait on the grand seignior: they are commanded by the chief aga, and constitute four classes, called oda's.

PAGE *of a book*. See PRINTING.

PAGEANT, a triumphal car, chariot, arch, or other like pompous decoration, variously adorned with colours, flags, &c. carried about in public shews, processions, &c.

PAGO, an island in the gulph of Venice, separated from the continent of Morlachia by a narrow channel; being forty miles long, and twelve broad, situated in east long. 16° 12′, north lat. 45′.

PAGOD, or PAGODA, a name whereby the East-Indians call the temple in which they worship their gods.

Before they build a pagod, they consecrate the ground as follows: after having enclosed it with boards or palisadoes, when the grass is grown on the ground they turn an ash-coloured cow into it, who stays there a whole day and night; and as cow-dung is thought by the Indians to be of a very sacred nature, they search for this sacred deposit, and having found it, they dig there a deep pit, into which they put a marble-pillar, ris-

ing confiderably above the furface of the earth. On this pillar they place the image of the god to whom the pagod is to be confecrated. After this the pagod is built round the pit, in which the pillar is fixed. The pagod ufually confifts of three parts, the firft is a vaulted roof fupported on ftone or marble-columns. It is adorned with images, and, being open, all perfons without diftinction are allowed to enter it: the fecond part is filled with grotefque and monftrous figures, and no body is allowed to enter it but the bramins themfelves: the third is a kind of chancel, in which the ftatue of the deity is placed: it is fhut up with a very ftrong gate. This word is fometimes ufed for the idol, as well as for the temple.

PAGOD, or PAGODA, is alfo the name of a gold and filver-coin, current in feveral parts of the Eaft-Indies. See COIN.

PAIN, *dolor*, is defined to be an uneafy fenfation arifing from a fudden and violent folution of the continuity, or fome other accident in the nerves, membranes, veffels, mufcles, *&c.* of the body; or, according to fome, it confifts in a motion of the organs of fenfe; and, according to others, it is an emotion of the foul occafioned by thefe organs.

There are various kinds of pain, one is attended with pulfation, another with a fenfe of incumbent weight, another with a tenfion; there is a pain which attends erofion, incifion, punction, and perforation, comprehended with thefe and the like differences under the name acute; and, laftly, there is a pain attended with a torpor and numbnefs.

Befides the above-mentioned, there are other diftinctions of pain: thus fome pains are fixed, others moveable and wandering, as it often happens in a redundance of humours: fome pains are continual, and others intermittent; fome intenfe, others remifs; fome again afflict the patient in the beginning of the difeafe, others afterwards; and fometimes they arife on the critical day, fometimes not; and to mention no more, fome pains are feated in the external parts, others in the internal; fome in the noble, others in the ignoble parts.

All pain proceeds from fome injury done to the parts affected; and according to Galen, it proceeds either from a fudden alteration of the part, or a new temperament fuddenly induced, or elfe from a folution of continuity. The internal parts fuffer pain from the violence of a fever, by which the nervous parts are dried and vellicated, or from an inflammation, an eryfipelas, fome great obftruction or abfcefs in the vifcera, or, laftly, from a flatus. Now fince thefe pains owe their rife to fuch caufes, they are juftly denominated bad, as well when alone, as when attendant on other diftempers; for all pain exhaufts the ftrength, promotes crudities, and impedes the concoction of the humours. The worft pains are thofe excited in the vifcera and noble parts; and of thefe the moft pernicious on all accounts are pains affecting the vifcera in a violent manner, and of a long and conftant duration, by which the natural heat of the vifcera is deftroyed, or refolved, and no room left to hope for a happy event.

Pain is mitigated or affuaged divers ways; as, 1. By diluting and foftening acrimonies with warm water mixed with flour, applied by way of drink, fomentation, clyfter, or bath. 2. By refolving and wafhing away obftructions by the fame means, and refolvents. 3. By relaxing the nervous veffels with drinks, fomentations, baths, relaxants, anodynes, and aperients. 4. By correcting the acrimony itfelf with proper remedies. 5. By freeing the obftruent, obftructed, and acrimonious parts from the too great preffure of the vital humours, and by foftening, fuppurating, and depurating them. 6. By rebating or deadening the fenfe by narcotics, either internally or externally. See the articles NARCOTICS, and ANODYNE.

For pains after delivery. See the article DELIVERY.

PAIN FORT ET DURE, in law, fignifies a particular punifhment inflicted on a perfon who being arraigned for felony, refufes to put himfelf upon the common trial of God and his country, but inftead thereof obftinately ftands mute: this punifhment is vulgarly called preffing to death. The judgment of this pennance is by the common law, and it is ufually practifed as follows, *viz.* that the prifoner be remanded back to prifon, and put into fome low dark room, and there laid flat on his back on the ground, without any other covering than what is neceffary to hide his nakednefs, and that his legs and arms be extended with cords to the four quarters of the room, at which time there is to be laid on his body as much weight, or more, than he can

can bear, and all the time he is to have no other support than the worst of bread and water, and is not to drink the same day that he eats, nor eat the day he drinks, and in this condition to remain till he dies. See the article MUTE.

PAINTING, the art of representing natural bodies, and giving them an appearance of life, by the turn of lines, and the degrees of colours.

Whoever would apply himself to painting, says that celebrated italian painter Leonardo da Vinci, must in the first place learn perspective: this will enable him to dispose things in their proper places, and to give the due dimensions to each: having done this, he must learn to design; choosing for that purpose some able master, who at the same time may give him some insight into the colours of figures: he ought then to consult nature, to confirm himself in what he has already learnt; and, lastly, let him apply himself to the study and imitation of the greatest masters, in order to get a habit of reducing what he has learnt into practice. See the articles DRAWING, DESIGN, PERSPECTIVE, &c.

To judge of the goodness of a painting, says Mr. Richardson, it is necessary to establish to ourselves a system of rules to be applied occasionally; and to assist the judgment herein, the following rules have been laid down: 1. The subject must be finely imagined, and, if possible, improved in the painter's hands; he must think well as an historian, poet, philosopher, or divine, and more especially as a painter, in making a wise use of all the advantages of his art, and in finding expedients to supply its defects. 2. The expression must be proper to the subject, and the characters of the persons: it must be strong, so that the dumb shew may be perfectly and readily understood: every part of the picture must contribute to this end; colours, animals, draperies, and especially the actions of the figures, and above all the airs of the heads. 3. There must be one principal light, and this, and all the subordinate ones, with the shadows and reposes, must make one entire and harmonious mass; the several parts must be well connected and contrasted, so as to render the whole as grateful to the eye, as a good piece of music to the ear. By this means the picture is not only more delightful, but better seen and comprehended. 4. The drawing must be just; nothing must be flat, lame, or ill-proportioned; and these proportions should vary according to the characters of the persons drawn. 5. The colouring, whether gay or solid, must be natural, beautiful and clean, and what the eye is delighted with, in shadows, as well as lights and middle tints; and whether the colours are laid on thick, or finely wrought, they must appear to be done by a light and accurate hand. Lastly, nature must be the foundation that must be seen at the bottom; but nature must be raised and improved, not only from what is commonly seen, to what is but rarely met with, but even yet higher, from a judicious and beautiful idea in the painter's mind, so that grace and greatness may shine throughout, more or less according to the subject. See COLOURING, CLARO-OBSCURO, &c.

Painting is of various kinds, according to the materials used, the matter upon which they are applied, and the manner of applying them; as painting in oil, in water-colours, fresco, &c.

PAINTING *in oil*. The whole secret of painting in oil consists in grinding the colours with nut oil, or linseed-oil; but the manner of working is very different from that in fresco, or in water, by reason the oil does not dry near so fast, which gives the painter an opportunity of touching and re-touching all the parts of his figures as often as he pleases; which in the other methods of painting is a thing impracticable. The figures done in oil, are also capable of more force and boldness; insomuch that the black becomes blacker, when ground with oil, than with water; besides, all the colours mixing better together, makes the colouring the sweeter, more delicate and agreeable, and gives an union and tenderness to the whole, inimitable in any of the other manners.

Painting in oil is performed on canvas, on walls, wood, stone, and all sorts of metals. 1. Painting on cloth or canvas is done as follows: the canvas being stretched on a frame, give it a layer of size, or paste water, and then go over it with a pumice-stone, to smooth off the knots. By means of the size, the little threads and hairs are all laid close on the cloth, and the little holes filled up, so that no colour can pass through. When the cloth is dry, lay on oker in oil, which may be mixed with white-lead to make it dry the sooner. When dry, go over it again with the pumice-

 stone,

ſtone, to make it ſmooth. After this a ſecond couch is ſometimes applied, compoſed of white-lead and a little charcoal-black, to render the ground of an aſh-colour. Others prime the canvas in the following manner, they firſt ſmooth the canvas with a pumice-ſtone, ſize it over with good ſize, and a little honey, and let it ſtand to dry; after which they lay it over with whiting and ſize, mixed with a little honey: the uſe of the honey is to prevent it from cracking, peeling, and breaking out; on this they firſt draw the picture with a coal, and then lay on the colours. 2. Painting on walls: when the wall is dry, they give it two or three waſhes with boiling oil; till the plaſter remains quite greaſy, and will imbibe no more; upon this they lay drying colours, ſuch as white-chalk, red-oker, or other chalks beaten pretty ſtiff. When this couch or layer is well dried, the ſubject, or deſign is ſketched out, and afterwards painted over, mixing a little varniſh with their colours, to ſave the varniſhing afterwards. In order the better to fortify the wall againſt moiſture, ſome cover it with a plaſter of lime, marble duſt, or a cement made of beaten tiles ſoaked in linſeed-oil: and at laſt prepare a compoſition of green pitch, maſtic, and thick varniſh boiled together, which they apply hot over the former plaſter; and when dry, lay on the colours as before. Others, in fine, make their plaſter with lime-mortar, tile-cement, and ſand; and this being dry, they apply another of lime, cement, and iron-ſcoriæ; which being well beaten, and incorporated with linſeed-oil, and whites of eggs, makes an excellent plaſter. When this is dry, the colours are laid on as before. 3. In painting on wood, they uſually give their ground a couch or layer of white tempered with ſize, and then proceed as in painting on walls. 4. In painting on ſtone or metals, it is not neceſſary to lay them over with ſize, but only to add a ſlight couch of colours before the deſign is drawn on it; nor even is this done on ſtones, where you would have the ground appear, as in certain marbles and agates of extraordinary colours.

All the colours uſed in freſco are good in oil, except white of lime and marble-duſt. Thoſe chiefly uſed are white-lead, or ceruſe, yellow and white maſticot, orpiment, vermillion, lacca, blue and green aſhes, verdigreaſe, indigo, ſmalt, black lead, ivory-black, lamp-black, &c. As to oils, the beſt are thoſe of linſeed, walnuts, ſpike, and turpentine. The drying oils or nut-oil, boiled with litharge and ſandarach, and otherwiſe with ſpirit of wine, maſtic and gum-lacca.

In the preparation of oil-colours, care muſt be taken, that they be ground fine; that in putting them on a pallet, thoſe which will not dry of themſelves be mixed with drying oil, or other ingredients of a drying quality; and that the tinged colours be mixed in as ſmall quantities as poſſible. As to the ſituation of the colours, the pureſt and ſtrongeſt muſt be placed in the front of the piece, and the colouring varied according to the ſubject, time and place. If the ſubject be grave, melancholy, or terrible, the general teint of the colouring muſt incline to brown, and black, or red and gloomy; but it muſt be gay and pleaſant in ſubjects of joy and triumph. See the article COLOURING.

For the other different methods of painting, ſee ENAMEL, FRESCO, GLASS, LIMNING, MINIATURE, &c.

PAIR, *par*, denotes two equal and ſimilar things joined together, either collectively, as a pair of gloves, or two ſimilar parts that compoſe one whole, or a ſet of things joined to make another complete, &c.

PAIR, in anatomy, an aſſemblage, or conjugation of two nerves, which have their origin together in the brain, or ſpinal marrow, and thence diſtributed into the ſeveral parts of the body, the one on one ſide, and the other on the other.

PAIS RECONQUIS, a part of Picardy, in France, formerly in poſſeſſion of the Engliſh, but loſt in the reign of queen Mary, anno 1558.

PAITA, a town of Peru, in South America, in weſt long. 80°, ſouth lat. 5°.

PAIX, a port-town ſituated on the north ſide of the iſland of Hiſpaniola, in weſt long. 72° 30′, north lat. 20°.

PALACE, *palatium*, a name generally given to the dwelling-houſes of kings, princes, and other great perſonages; and taking different epithets, according to the quality of the inhabitants, as imperial palace, royal palace, pontifical palace, cardinal palace, ducal palace, epiſcopal palace, &c.

PALACIOS, a town of Spain, in the province of Andaluſia, ſituated fifteen miles ſouth of Seville.

PALÆSTRA, in grecian antiquity, a public building, where the youth exercifed themfelves in wreftling, running, playing at quoits, &c.

Some fay the palæftra confifted both of a college and an academy, the one for exercifes of the mind, the other for thofe of the body; but moft authors rather take palæftra to be a xyftus, or mere academy for bodily exercifes. Hence,

PALÆSTROPHYLAX was the director of the palæftra, and the exercifes performed therein. See the preceding article.

St. PALAIS, a town of France, in the province of Gafcony, capital of the lower Navarre, fituated in weft long. 1° 8′, north lat. 43° 23′.

PALAMBOANG, or PALAMBANG, the capital of a kingdom at the eaft end of the ifland of Java, in the Eaft-Indies, fituated on the ftraits of Bally, in eaft long. 114°, fouth lat. 7° 30′, and feparated from the ifland of Bally by a narrow ftrait.

PALAMOS, a port-town of Spain, in the province of Catalonia, fituated on the Mediterranean, fifteen miles fouth-eaft of Girone.

PALANKA, a town of upper Hungary, fituated thirty miles north of Buda.

PALANQUIN, a kind of chaife, or chair, borne by men on their fhoulders, much ufed by the people of China, and the eaft, as a vehicle for their eafy conveyance from place to place.

PALARIA, among the Romans, a kind of exercife, performed at a ftake by the foldiers. The ftake being fixed in the ground, and fix feet high above it, the young undifciplined foldiers advanced againft it, armed with a hurdle and cudgel, inftead of a fhield and fword, and went through all the rules of attack and defence, as if actually engaged with an adverfary. Sometimes they ftood at a diftance, and attacked it with miffive weapons, at the fame time ufing all the requifite motions for defending themfelves, and warding off what might be thrown againft them.

PALATE, *palatum*, in anatomy, the flefh that compofes the roof, or the upper and inner part of the mouth. See the article MOUTH.

The palate has much the fame ftructure with the gums, but it has alfo a great number of glands, difcovered fo early as the time of Fallopius: thefe are principally fituated in the hinder part near the uvula, where it is pendulous, in the manner of a curtain, which part is called the velum, or clauftrum, of the palate. The glands fituated particularly in this part, fecrete a mucous fluid, ferving to lubricate the mouth and throat, and to facilitate deglutition: they have a great number of apertures there for the difcharge of this humour into the mouth. See the article GLAND.

The great ufes of this membrane are to defend the bones of the palate from corrupting, and for preventing by its clauftrum or velum, the things to be fwallowed from getting up into the noftrils.

Wounds of the palate and other parts of the mouth, are only to be healed by being anointed with honey of rofes, either alone, or mixed with balfam of Peru, or with oil of myrrh per deliquium.

Offa PALATI, *bones of the palate.* Thefe are two, fituated in the pofterior part of the arch of the palate, between the pterygoide apophyfis, and the offa maxillaria, and running up on the fides of the nafal foffæ all the way to the bottom of each orbit. The figure of thefe bones is very irregular: the vomer is joined to them in the furrow of their upper furface. Their ufes are firft to form the palate, the orbit, and the maxillary finus; fecondly, to fuftain the membrane of the palate, and uvula; and thirdly, to affift in the modulation of the voice. See the articles MAXILLA, VOMER, &c.

PALATINATE, a province, or fignory, poffeffed by a palatine.

PALATINATE *of Bavaria*, or, *the upper* PALATINATE, in the circle of Bavaria, in Germany, is bounded by Voightland, in the circle of upper Saxony, on the north; by Bohemia and Auftria on the eaft; by the river Danube, which feparates it from the dutchy of Bavaria, on the fouth; and by Swabia, and part of Franconia on the weft; being about feventy miles long, and forty broad.

PALATINATE *of the Rhine*, fituated in the circle of the lower Rhine, is bounded by the archbifhoprics of Mentz and Triers on the north; by the circles of Franconia and Swabia on the eaft; and by Alfatia and Lorrain on the fouth and weft; being upwards of a hundred miles long, and about feventy broad.

PALATINE, or COUNT PALATINE, a title antiently given to all perfons who had any office or employment in the prince's palace; but afterwards conferred on thofe delegated by princes to hold

courts

courts of juftice in the provinces; and on fuch among the lords as had a palace, that is a court of juftice, in their own houfes.

At prefent the word palatine is reftrained to a prince of Germany, or a lord of Poland, poffeffed of a palatinate.

PALATINE GAMES, in roman antiquity, games inftituted in honour of Auguftus by his wife Livia, after he had been enrolled in the number of the gods. They were celebrated in the palace, and were continued by the fucceeding emperors.

PALATINE TRIBES, one of the four tribes into which Rome was antiently divided by Servius Tullius.

PALATO SALPINGÆUS, called alfo mufculus tubæ novus Valfalvæ, and pterygoftaphylinus externus, a mufcle arifing broad and tendinous from the edge of the lunated part of the os palati; feveral of its fibres being fpread on the membrane that covers the foramen narium, whence growing into a fmall thin tendon, it is reflected about the hooklike procefs of the inner wing of the proceffus pterygoidæus internus, and is inferted carnous into all the membranous, flefhy, and cartilaginous parts of the tube, which leads from the palate to the ear. Its ufe is to dilate and keep open this tube.

PALATO-STAPHYLINUS, in anatomy, a mufcle arifing on each fide from the junction of the bones of the palate. It is broad at its beginning, but afterwards joins its affociate, and becomes then narrower, fo as to refemble a triangle, which defcends from the place of its origin to the uvula, and is inferted into its upper part: it draws it upward and forward.

PALAZULO, or PLAZZO, a town of Sicily, in the Val. de Noto, fituated eighty miles fouth-weft of Meffina.

PALAZULO, a town of Italy, in the territory of Venice, and province of Brefcia, fituated on the river Oglio, twenty-fix miles north-eaft of Milan.

PALE, *palus*, a little pointed ftake or piece of wood, ufed in making inclofures, feparations, &c. The pale was an inftrument of punifhment, and execution among the antient Romans, and ftill continues fo among the Turks. Hence, empaling, the paffing a fharp pale up the fundament through the body.

PALE, in heraldry, one of the honourable ordinaries of an efcutcheon; being the reprefentation of a pale or ftake placed upright, and comprehending the whole height of the coat from the top of the chief to the point. When the pale is fingle, it is to contain one third of the breadth of the fhield. See pl. CLXXXIX. fig. 5.

When there are feveral, more properly called pallets, they are proportioned fo as that two take up two fifths of the fhield, and three take up three-fevenths; and in thofe cafes the number of pieces are fpecified, as well as that of thofe they are charged withal, &c.

Pales are borne various ways, as wavy, crenelle, faillis, indented, ingrailed, inverted, &c. There are alfo cometed and flaming pales, which are pointed, fometimes waved, &c.

PALE', PALED. See the article PALY.

In PALE, is applied to things borne above one another in manner of a pale.

Parti per PALE. See the article PARTI.

PALED FLOWERS, in botany, are thofe which have their leaves fet about, or furrounding, an head, or thrum, as in marigolds, &c.

PALES, or PILES, in carpentry, denote rows of ftakes driven deep into the ground to make wooden-bridges over rivers; they ferve to fupport the beams laid acrofs them, from one row to another, and are ftrongly bound with crofs pieces.

PALENCIA, or PLACENTIA, a city of Spain, in the province of Leon, fituated on the river Cea, fixty miles fouth-eaft of Leon.

PALERMO, the capital of the ifland of Sicily, fituated on the north coaft of that ifland, on a bay of the Mediterranean Sea: in eaft long. 13°, north lat. 38° 30′.

PALESTINE, a part of afiatic Turky, fituated between thirty-fix and thirty-eight degrees of eaft longitude, and between thirty-one and thirty-four degrees of north latitude: it is bounded by Mount Libanus, which divides it from Syria on the north; by Mount Herman, which feparates it from Arabia Deferta on the eaft; by the mountains of Seir and the Defarts of Arabia Petræa on the fouth; and by the Mediterranean Sea on the weft.

It was called Paleftine from the Philiftines, who inhabited the fea-coafts. It was alfo called Judea, from Juda; and the Holy Land from our Saviour's refidence and fufferings in it; and it is called Canaan, and the Promifed Land in the fcriptures.

It

It is 150 miles in length, and 80 in breadth; and in the time of Solomon it seems to have extended from the Mediterranean Sea to the river Euphrates.

PALESTRINA, a city of Italy, in the pope's territory and Campania of Rome, situated thirty miles east of Rome.

PALICAT, or PELIÇATE, a port-town of hither India, in Asia, situated on the coast of Coromandel: in east long. 80° north lat. 14°.

PALILIA, a feast among the antient Romans, in honour of the goddess Pales. The Palilia were celebrated with great festivity by the shepherds on the first of May, to beseech that goddess to take care of their flocks, and preserve them from wolves and diseases. Part of the ceremony consisted in burning heaps of straw, and jumping over them.

PALILICIUM, in astronomy, the star called the bull's-eye, or aldebaran. See the article ALDEBARAN.

PALIMBAM, a town on the island of Sumatra, in the East-Indies, situated in east long. 103°, south lat. 3°.

PALINDROMUS, παλινδρομος, a verse or sentence which runs the same when read either backwards or forwards; such is the verse,

Roma tibi subito montibus ibit amor.

Some people of leisure have refined upon the palindromus, and composed verses each word whereof is the same backwards as forwards, as that instance in Camden;

Odo tenet mulum, madidam mappam tenet Anna.

Anna tenet mappam madidam mulum tenet Odo.

PALING, a sort of fencing for fruit-trees planted in fields, wherein three small posts are erected at a foot and a half distance one from another, and near the top nailed to each other with cross-bars. In fixing the pales in form of a triangle, room is to be left for the tree to play and bow by the high winds, without galling: the trees are to be bound to a stake for a year or two, after which, fern or straw may be stuffed in betwixt the tree and uppermost rails to keep it upright. If the place be open to deer, rabbits, or the like, a post is to be nailed to the bar between every two pales.

PALINGENESIA, among divines, signifies the same with regeneration. Among chemists, it denotes the producing a body from its principles.

PALINODY, παλινωδια, a discourse contrary to a preceding one: hence the phrase *palinodiam canere* was taken for a recantation.

PALISADE, or PALISADO, in fortification, an inclosure of stakes or piles driven into the ground, each six or seven inches square, and eight feet long, three whereof are hid under-ground. Palisadoes are generally used to fortify the avenues of open forts, gorges, half-moons, the bottoms of ditches, the parapets of covert ways, and in general all post liable to surprize, and to which the access is easy. Pallisadoes are usually planted perpendicularly, though some make an angle inclining towards the ground next the enemy, that the ropes cast over to tear them up may slip.

Turning PALISADES, are an invention of M. Coehorn, in order to preserve the palisades of the parapet of the covert-way from the besiegers shot. He orders them so, that as many of them as stand in the length of a rod, or in about ten feet, turn up and down like traps, so as not to be in sight of the enemy till they just bring on their attack, and yet are always ready to do the proper service of palisades.

PALISADE, in gardening, denotes a sort of ornament; being a row of trees which bear branches and leaves from the bottom, cut and spread in manner of a wall along ths side of an alley, or the like, so as to appear like a wall covered with leaves.

PALISSE', in heraldry, a bearing like a range of palisades before a fortification, represented on a fesse, rising up a considerable height, and pointed a-top, with the field appearing between them. See plate CLXXXIX. fig. 6.

PALIURUS, CHRIST'S THORN, in botany, a species of rhamnus. See the article RHAMNUS.

PALL, in heraldry, denotes a kind of cross representing the pallium, or archiepiscopal ornament sent from Rome to the Metropolitans. See plate CXCIII. fig. 1.

PALL, *pallium*, in matters of dress. See the article PALLIUM.

PALLA, in roman antiquity, a mantle which women wore over the gown called stola. It was borne on the left shoulder, whence passing to the other side, under the right arm, the two ends were bound under the left arm, leaving the breast and arm quite bare.

PALLADIUM, in antiquity, a statue of the

the goddess Pallas, supposed to have dropped down from heaven, preserved in Troy, whereon the fate of that city is said to have depended. It is said that there was antiently a statue of Pallas preserved at Rome, in the temple of Vesta, which some pretended to be the true palladium of Troy, brought into Italy by Æneas: it was kept among the sacred things of the temple, and only known to the priests and vestals. It was esteemed the destiny of Rome; and there were several others made perfectly like it to secure it from being stolen, as was that at Troy, which the oracle of Apollo declared should never be taken so long as the palladium was found within its walls: this occasioned Diomede and Ulysses, in the time of the trojan war, to undertake the stealing of it.

PALLET, among painters, a little oval table, or piece of wood, or ivory, very thin and smooth; on, and round which, the painters place the several colours they have occasion for, to be ready for the pencil. The middle serves to mix the colours on, and to make the tints required in the work. It has no handle, but instead thereof, a hole at one end to put the thumb through to hold it.

PALLET, among potters, crucible makers, *&c.* a wooden instrument, almost the only one they use, for forming, heating, and rounding their works: they have several kinds, the largest are oval with a handle; others are round, or hollowed triangularly; others, in fine, are in manner of large knives, serving to cut off whatever is superfluous on the moulds of their work.

PALLET, in gilding, an instrument made of a squirrel's tail, to take up the gold leaves from the pillow, and to apply and extend them on the matter to be gilt. See the article GILDING.

PALLET, in heraldry, is nothing but a small pale, consisting of one half of it in breadth, and therefore there are sometimes several of them upon one shield.

PALLET is also a part belonging to the ballance of a watch or movement. See the article WATCH.

PALLET, in ship-building, is a room within the hold, closely parted from it, in which by laying some pigs of lead, *&c.* a ship may be sufficiently ballasted, without losing room in the hold; which, therefore, will serve for the stowing the more goods.

PALLIATION, or a PALLIATIVE CURE, in medicine, is when, in desperate and incurable diseases, after predicting the fatal event, the physician prescribes some remedies for mitigating the pain, or some other urgent symptoms, as in ulcerated cancers, or cancerous fistulas, and the like.

Palliative indication, is where the symptoms of a disease give too much trouble and danger to have their cure deferred till the disease whereon they depend is removed: here the symptoms themselves are to be cured or mitigated apart.

PALLIER, or PAILLIER, in building, denotes a landing-place in a stair-case. See the article STAIR-CASE.

PALLIFICATION, the strengthening the foundation of any building, by driving piles into the ground. See the articles FOUNDATION and PILE.

PALLIUM, or PALL, an archiepiscopal vestment, of white woollen cloth, about the breadth of a border, made round, and thrown over the shoulders. Upon this border there are two others of the same matter and form, one of which falls down upon the breast, and the other upon the back, each having a red cross upon it; several crosses of the same colour being likewise upon the upper part of it, about the shoulders.

The pall was part of the imperial habit, and originally granted by the emperors to patriarchs; but at present it is given by the pope as a mark of the apostolic power, without which neither the function or title of archbishop can be assumed by the bishops of his communion.

PALM, *palma*, in anatomy, the inside of the hand, called also vola. See the articles HAND and PALMARIS.

PALM is also a measure of length. See the article MEASURE.

PALM-SUNDAY, in the christian church, the Sunday next before Easter; being so called in memory of our Saviour's triumphal entery into Jerusalem, when the multitude that attended him strewed palm-branches in his way. See the article EASTER.

PALM-TREE, PHOENIX, in botany, *&c.* See the article PHOENIX.

PALMA, a town of Portugal, in the province of Alentejo: west long. 9°, north lat. 38° 30′.

PALMA is also a city of Terra Firma, in south-America: west long. 74°, north lat. 4° 30′.

PALMA, or PALAMODA, a town of Italy, eight miles north of Aquileia.

PALMA-ISLE, one of the Canary-Iſlands, ſixty miles north-weſt of Teneriff.

PALMARIS MUSCULUS, one of the flexor muſcles of the hand, ſo called as being inſerted into the palm of the hand by a broad expanded tendon: its office ſeems to be the conſtriction of the palm. There is alſo another muſcle of the hand called palmaris brevis, and quadratus, in form of a ſmall maſs of fleſh, which adheres to the aponeuroſis of the former muſcle, above the abductor muſcle of the little finger: it is ſaid to aſſiſt in drawing together the hand; but Heiſter obſerves, that both theſe muſcles are found wanting in diſſections.

PALMAS, or CAPE PALMAS, a promontory on the Guinea-coaſt: weſt long. 8°, north lat. 4° 30′.

PALMATED, ſomething reſembling the ſhape of the hand: thus we ſay palmated leaves, roots, ſtones, &c.

PALMIPEDES, among ornithologiſts, the ſame with web-footed birds. See the articles BIRD and ORNITHOLOGY.

PALMISTRY, a kind of divination, or rather a deceitful art practiſed by gypſies, who pretend to foretel events by looking upon the lines and marks of the hand: it is prohibited by ſtat. 1 and 2 Phil. & Mar. c. 4.

PALMYRA, the ruins of a magnificent city, in the province of Syria, two hundred miles ſouth-eaſt of Aleppo.

PALOS, a port-town of Spain, ſituated on the bay of Cadiz: weſt long. 7° 15′, north lat. 37°.

Cape PALOS, is a promontory of Spain, twenty miles eaſt of Carthagena.

PALOTA, a town of lower Hungary, forty miles ſouth-weſt of Buda.

PALPABLE, ſomething perceivable by the ſenſes, particularly that of feeling.

PALPEBRÆ, the EYE-LIDS, in anatomy. See the article EYE.

PALPITATION, in medicine, a ſpaſtic contraction of the heart, when it leaps and beats violently.

The heart often palpitates ſo much as to be heard at a diſtance, which may be owing to a violent motion of the body; chiefly when plethoric people aſcend high places: ſometimes it happens through fear or dread; and ſometimes from a bad conformation of the heart and the neighbouring veſſels. Sleeping in the fields, ſuppreſſion of the menſes, and the like, are likewiſe ſaid to occaſion it. Bleeding in the foot, and gentle purges, are generally the firſt ſteps towards a cure; after which, ſaline, nitrous, and cinnabarine medicines are to be uſed, particularly the antiſpaſmodic, to appeaſe the violent motions of the heart, and render the blood more fluid. The aqueous infuſions of tea, balm, veronica, primroſes, or citrons, are likewiſe proper, eſpecially with the eſſence of ſcordium, carduus benedictus, citron or orange-peel, with a little dulcified ſpirit of nitre, or terra foliata tartari, taken morning and evening; as alſo temperate pediluvia, moderate but frequent exerciſe, riding, moderate diet, plenty of thin drink, whey, mineral waters, eſpecially the chalybeate kind, are all very uſeful in this diſeaſe.

PALSGRAVE, among the Germans, the ſame with palatine. See the article PALATINE.

PALSY, παράλυσις, in medicine, a diſeaſe wherein the body, or ſome of its members, loſe their motion, and ſometimes their ſenſation of feeling.

The apoplexy, ſays Dr. Mead, when not mortal, frequently terminates in a palſy, which is the criſis of the diſeaſe: this palſy generally ſeizes but one ſide of the body; and what Morgagni obſerves, after Valſalva, that, on diſſection of the bodies of apoplectics who had been ſeized with a hemiplegia, he always found the cauſe of the diſeaſe in the oppoſite ſide of the brain, the doctor ſays he has formerly found true more than once in St. Thomas's hoſpital. There is now no longer any room for blood-letting, or draſtic purges; it will be ſufficient to give warm and moderate cathartics now and then, ſuch as the tinctura ſacra. And as the diſeaſe is now become chronical, inſtead of bliſters it will be requiſite to make iſſues in proper places, eſpecially in the nape of the neck, and above the ſcapulæ, either with the actual cautery, or with cauſtic medicines. Hippocrates adviſes to apply the actual cautery in eight places, at leaſt, and ſpecifies them.

The cure is to be chiefly proſecuted with aromatic ſtrengtheners and ſteel; and beſides, it is of ſervice to ſtimulate the ſkin of the paralytic part; which is extremely well effected by the green ointment, mixed with the ſeventh or eighth part of the ſtrong ſpirit of vitriol; and, when the part begins to be rubified, the liniment is to be removed, and the part anointed with ointment of elder. Cold bathing is very beneficial in perſons not too far advanced in years; but hot bathing

bathing is prejudicial to all paralytics; ſome of whom the doctor has known ſent to Bath by a miſtaken notion of their phyſicians, who, upon coming out of the bath, were ſeized with a return of the apoplexy, which carried them off.

Wherefore the doctor makes the following remarks on theſe waters. Their chief virtue ſeems to conſiſt in a certain mineral heat, whereby they warm and cheriſh the ſtomach and inteſtines; and, therefore, they are chiefly ſerviceable to thoſe who have ruined their appetite and digeſtive faculty by drinking wine or other ſpirituous liquors, which is well known to be the cauſe of a number of evils: but they are very prejudicial to all whoſe inward parts, as the brain, lungs, liver, or kidneys, are too hot. And, for the ſame reaſon, though they may be agreeable to, and mend, the ſtomach, yet, if the uſe of them be continued too long, they more frequently hurt this organ: that very warmth which was beneficial at firſt, by immoderate perſeverance, becoming prejudicial, by over-relaxing the fibres. A circumſtance which the doctor ſeveral times obſerved, more particularly in patients whoſe diſeaſes were owing to a fault in the nervous fluid.

This diſeaſe never is acute, is often tedious, and in old people almoſt incurable; and the patient for the moſt part drags a miſerable life. For the vigour of his mind, together with his memory are loſt, or vaſtly impaired; he totters and ſhakes, and becomes a diſmal ſight; as if no longer a man, but an animal half dead.

PALUDAMENTUM, in roman antiquity, a habit that differed in little from the chlamys, except that this laſt belonged chiefly to the lower claſs of people. See the article CHLAMYS.

However, they are promiſcuouſly uſed for each other; being the robes of ſtate proper to emperors, kings, conſuls, and generals during their triumph.

PALUMBERIUS, ACCIPITER, the goſhawk. See the article GOSHAWK.

PALUMBUS, the RINGDOVE, a beautiful ſpecies of pigeon, with the neck white on each ſide, and a brown ſpot behind. See the article COLUMBA.

PALUS MEOTIS. See MEOTIS.

PALY, or PALE', in heraldry, is when the ſhield is divided into four or more equal parts, by perpendicular lines falling from the top to the bottom. See plate CXCIII. fig. 3.

Paly-bendy is when the eſcutcheon is divided by perpendicular lines, which is paly; and alſo by diagonals, which is called bendy. See the article BENDY.

PAMIERS, a town of Languedoc, thirty miles ſouth of Toulouſe.

PAMPELUNA, the capital of ſpaniſh Navarre, is the ſee of a biſhop, and an univerſity: weſt long. 1° 30', north lat. 43° 15'.

PAMPELUNA, is alſo a city of Terra Firma, in ſouth America: weſt long. 72°, north lat. 7°.

PAMPHYLIA, the antient name of a part of Carimania.

PAMPINIFORME CORPUS, in anatomy, a plexus, or knot, formed by the ſpermatic veins and arteries, and included in a common coat, within the teſticle. See the article TESTICLE.

PANACEA, among phyſicians, denotes an univerſal medicine, or a remedy for all diſeaſes; a thing impoſſible to be obtained, according to no leſs an author than Boerhaave.

Some alſo give the appellation panacea to certain plants, called in engliſh alheals.

PANADA, a diet conſiſting of bread boiled in water to the conſiſtence of a pulp, and ſweetened with a little ſugar. It is given to young children, and to ſick perſons, whoſe digeſtion is weak, or where ſtronger foods would be improper. It is ſometimes made thin, to ſerve as a drink.

PANAMA, the capital city of the province of Darien, in ſouth America, where the treaſures of gold and ſilver, and the other rich merchandize of Peru are lodged in magazines till they are ſent to Europe: weſt long. 82°, north lat. 9°.

PANARIA, one of the Lipari iſlands, thirty miles north of Sicily: eaſt long. 15°, north lat. 39°.

PANARIS, or PARONYCHIA, in medicine and ſurgery. See PARONYCHIA.

PANARO, a river of Italy, which riſing in the appenine mountains, on the confines of Tuſcany, divides Modena from Romania, and then running through the Ferrareſe, falls into the Gulph of Venice.

PANATHENÆA, παναθηναια, in grecian antiquity, an antient athenian feſtival, in honour of Minerva, who was the protectreſs of Athens, and called Athena. There were two ſolemnities of this name, one of which was called the greater panathenæa, and celebrated once in five years; and the other, the leſſer

panathenæa, kept every third year, or, as ſome think, every year. At the celebration of the leſſer feſtival, there were three games, managed by ten preſidents elected out of the ten athenian tribes. On the evening of the firſt day was a torch race, firſt by men on foot, and next by horſemen. The ſecond contention was a gymnical exerciſe, in which the diſputants gave proofs of their ſtrength and activity. The laſt was a muſical contention: and afterwards the pyrrhic dance was performed by young boys in armour. Laſtly, they offered a coſtly ſacrifice, towards which, every one of the athenian boroughs contributed an ox. In the greater panathenæa, moſt of the ſame rites and ceremonies were practiſed, but with greater ſplendor, with the addition of ſome others, as particularly a proceſſion, in which Minerva's ſacred garment was carried; on this garment the atchievements of Minerva, &c. were embroidered with gold, by a ſelect number of young virgins.

PANAX, GINSENG, in botany, a genus of the pentandria-digynia claſs of plants, the general corolla of which is uniform; the partial corolla conſiſts of five, oblong, crooked, equal petals: the fruit is a roundiſh berry, having one cell, and is coronated with the cup: the ſeeds are two, and of a kidney-like ſhape.

The numerous virtues of this plant have been already given under GINSENG.

PANAY, the capital of the iſle of Panay, one of the Philippine iſlands; eaſt long. 119°, and north lat. 11°.

PANCARPUS, in roman antiquity, a kind of ſhew which the roman emperors frequently exhibited to the people. In this ſpectacle, the circus being ſet all over with large trees, repreſented a foreſt, into which the beaſts being let from the dens under the ground, the people, at a ſign given by the emperor, purſued, ſhot, cut in pieces, and killed all they could lay hold of, which they afterwards carried away, to regale upon at home. The beaſts uſually given on theſe occaſions were boars, deer, oxen, and ſheep.

PANCH, or PAUNCH. See PAUNCH.

PANCHREAS, or PANCREAS. See the article PANCREAS.

PANCHREST, in medicine, the ſame with panacea. See PANACEA.

PANCHYMAGOGUE, in pharmacy, a name given to ſome cathartic extracts, that have the reputation of purging off all kinds of humours. The moſt celebrated of which, are that of Crollius, and that of Hartman. Crollius's panchymagogue is an extract of the pulp of coloquintida, of pulvis diarrhodon abbatis, agaric, and black hellebore. That of Hartman is an extract made from ſena-leaves, rhubarb, black hellebore-root, white reſinous turpeth, polypody of the oak, trochiſci, alhandal, troches of agaric, and aloes.

PANCRATIUM, παγκράτιον, among the antients, a kind of exerciſe, which conſiſted of wreſtling and boxing. In theſe conteſts it was cuſtomary for the weaker party, when he found himſelf preſſed by his adverſary, to fall down, and fight rolling on the ground.

This was the third gymnaſtic exerciſe, and was not introduced till long after the others.

Thoſe who engaged in theſe exerciſes were called pancratiaſtæ; which name was alſo given to ſuch as did not confine themſelves to one exerciſe, but ſucceeded in ſeveral different ones.

PANCRATIUM, SEA DAFFODIL, in botany, a genus of the hexandria-monogynia claſs of plants, the flower of which conſiſts of ſix lanceolated petals, and its nectarium is a ſingle, tubular infundibuliform petal; the fruit is a roundiſh triquetrous capſule, formed of three valves, and containing three cells, with numerous globoſe ſeeds.

PANCREAS, in anatomy, popularly called the ſweet-bread, is a large gland, of a flattiſh ſhape and fleſhy colour, extended behind the ſtomach, and reaching from the duodenum tranſverſely towards the ſpleen. Its length is eight or nine inches; its breadth about two fingers, or two and a half; its thickneſs about one finger; and its weight about three ounces. In man, the ſhape of the pancreas very much reſembles the tongue of a dog; it is broadeſt towards the duodenum, and gradually narrower towards the ſpleen. Its ſubſtance is glandulous, and it ſeems formed by a conglomeration of many glands. It is ſurrounded with a membrane, which is continuous with the peritonæum: it has arteries from the cœliac and ramus ſplenicus; and veins alſo from the ſplenic vein; its nerves are from the par vagum and the intercoſtals; and finally it has an excretory duct, which is ſituated in the middle of the pancreas, where it reſembles an empty vein, and is about the thickneſs of a ſmall ſtraw. This duct terminates in the duodenum,

denum, which it enters obliquely, four or five fingers breadth below the pylorus, ufually at the fame orifice with the ductus cholidocus; but fometimes it has a double aperture.

The ufe of the pancreas is to fecrete a peculiar liquor, called the pancreatic juice, which is of a falivofe nature, and is carried by the pancreatic duct into the duodenum, where it ferves to dilute the chyle, to render it more fluid, and fit to enter the mouths of the lacteals; and, perhaps, to temper and dilute the bile, to change its vifcidity, bitternefs, colour, &c. and make it mix with the chyle, in order to reduce the feveral taftes, odours, and properties of the feveral foods, into one homogeneous one. See the articles CHYLE and BILE.

PANDECTS, in the civil law, collections made by Juftinian's order, of five hundred and thirty-four decifions of the antient lawyers, on fo many queftions occurring in the civil law; to which that emperor gave the force and authority of law, by an epiftle prefixed to them. The pandects confift of fifty books, and make the firft part of the body of the civil law. See the article CIVIL LAW.

PANDICULATION, a ftretching, or that violent and tenfive motion of the folids, which ufually accompanies the act of yawning.

PANDORON, in antiquity, a mufical inftrument, refembling a lute, but with ftrings of brafs; its frets were of copper, and its back flat, like the guitar. See the articles LUTE and GUITAR.

PANEGYRIC, an oration in praife of fome extraordinary thing, perfon, or virtue.

Panegyrics were antiently made in the public and folemn affemblies of the Greeks, either at their games, their feafts, or religious meetings. To render them the more folemn, they ufed to begin with the praifes of the deity, in whofe honour the games, &c. were celebrated; then they defcended to the praifes of the people or country where they were celebrated; then to the princes or magiftrates who prefided at them; and at length to the champions, efpecially thofe who had gained the prize.

Panegyric is ranked among the demonftrative kinds of orations, whereof there are commonly reckoned two kinds, *viz.* the artificial, where every thing is reduced to certain heads; and the other natural, where the order of hiftory is obferved.

PANEGYRICUM, in church-hiftory, an ecclefiaftical book, ufed by the greek church, containing the panegyrical orations of various authors, on the folemnities of Jefus Chrift and the faints. Among the principal authors of this work are St. Athanafius, Cyrill, Bafil, Chryfoftom, &c.

PANEL, in law, fignifies a fchedule, or fmall roll of parchment, in which is contained the names of the jurors returned by the fheriff, to pafs upon trial; fo that the impanelling of a jury is no more than the fheriff's entering them upon his panel or roll.

PANEL, or PANNEL, in joinery. See the article PANNEL.

PANGONIA, in natural hiftory, the name of a genus of cryftal, confifting of fuch as are compofed of many angles. See the article CRYSTAL.

The bodies of this genus are fingle-pointed, or imperfect cryftals, compofed of dodecangular or twelve-planed columns, terminated by twelve-planed pyramids, and the whole body, therefore, made up of twenty-four planes. Of this genus there are only three known fpecies. 1. A brownifh-white one, with a long pyramid. This is found in Silefia and Bohemia; fometimes in mountains, and fometimes on the fides of rivers, and is efteemed a very valuable cryftal. 2. A yellowifh-brown one, with a fhort pyramid. This is often brought over to us under the name of faxon topaz, among the other cryftals commonly known by that name. And, 3. A clear colourlefs one, with a very fhort pyramid. This is a very valuable cryftal, and is produced in the Eaft-Indies, being often brought over among the indian ballaft.

PANIC, denotes an ill-grounded terror or fright.

Polyænus fetches the origin of the phrafe from Pan, one of the captains of Bacchus, who, with a few men, put a numerous army to rout, by a noife which his foldiers raifed in a rocky valley favoured with a great number of echoes; for this ftratagem making their numbers appear much greater than it really was, the enemy quitted a very commodious encampment, and fled. Hence, fays our author, all ill-grounded fears have been called panics, or panic fears.

PANICLE, in botany, denotes a foft woolly beard, on which the feeds of fome plants, as millet, reeds, &c. hang.

PANICUM, PANIC, in botany, a genus of

of the triandria-digynia clafs of plants, the flower of which is compofed of two fharp-pointed valves, and inclofes the feed, which is fingle and roundifh, but fomewhat flatted.

Panic-feed is accounted drying, refrigerant, and aftringent; and therefore recommended in fpitting of blood, and nocturnal pollutions.

PANNAGE, *pannagium*, in law-books, fignifies the food that fwine feed upon in woods, as maft of beech and acorns; or money taken by the king's agiftors for the privilege of feeding hogs in the king's foreft.

PANNEL, or PANEL, in law. See the article PANEL.

In the fcotch law, pannel fignifies the prifoner at the bar, or perfon who takes his trial before the court of jufticiary, for fome crime.

PANNEL, in joinery, is a tympanum, or fquare piece of thin wood, fometimes carved, framed, or grooved in a larger piece, between two upright pieces and two crofs-pieces.

PANNEL, in mafonry, is one of the faces of a hewn ftone.

PANNELS *of a faddle*, are two cufhions or bolfters, filled with cow's, deer's, or horfe-hair, and placed under the faddle, on each fide, to prevent the bows and bands from galling the horfe.

PANNICULUS CARNOSUS, in comparative anatomy, a robuft flefhy tunic, fituated in beafts, between the tunic and the fat; by means of which they can move their fkin in whole or part: it is altogether wanting in mankind.

PANNIER, CORBEIL, or BASKET, in fortification. See BASKET.

PANNUS, in medicine, the fame with the unguis of the eye. See UNGUIS.

PANORPA, the SCORPION-FLY, in zoology, a genus of infects, with membranaceous wings, the roftrum or trunk whereof is cylindric and of a horny ftructure, and there is a weapon of the cheliform kind at the tail; the antennæ are fetaceous, black, and compofed of no lefs than thirty articulations; the back is brown; the fides are yellow; and the wings are white.

PANSWICK, a market-town, fix miles fouth of Glocefter.

PANTALOON, a fort of garment, confifting of breeches and ftockings all of one piece; faid to have been firft introduced by the Venetians.

In a theatrical fenfe, pantaloon denotes a buffoon, who performs grotefque dances; and hence is ufed, by fome, for the habit or drefs worn by fuch perfons.

PANTHEA, in antiquity, ftatues compofed of the figures or fymbols of feveral divinities.

PANTHEON, in roman antiquity, a temple of a circular form, dedicated to all the gods: it was built by Agrippa, fon-in-law to Auguftus; but is now converted into a church, and dedicated to the Virgin and all the martyrs.

PANTHER, *panthera*, in zoology, the female leopard. See LEOPARD.

PANTOMIME, in antiquity, a perfon who imitates all forts of actions and characters, by mere geftures, without fpeaking a word.

PANTON-SHOE. See HORSE-SHOE.

PANUCO, a city of Mexico, fituated at the mouth of a river of the fame name, which falls into the gulph of Mexico: weft longitude 103°, and north latitude 23°.

PAPA, a town of lower Hungary, fubject to the emprefs-queen: eaft long. 18°, and north lat. 47° 40'.

PAPAL CROWN. See CROWN.

PAPAVER, the POPPY, in botany. See the article POPPY.

PAPAYA, or CARICA, in botany. See the article CARICA.

PAPENHEIM, a town of Franconia, in Germany, fubject to its own count: eaft long. 11°, north lat. 48° 55'.

PAPER, παπυρος, fheets of a thin matter, made of fome vegetable fubftance.

The materials on which mankind have, in different ages, contrived to write their fentiments, have been extremely various; in the early ages they made ufe of ftones, and tables of wood, wax, ivory, &c. See the article BOOK.

Paper, with regard to the manner of making it, and the materials employed therein, is reducible to feveral kinds; as egyptian paper, made of the rufh papyrus; bark-paper, made of the inner rind of feveral trees; cotton paper; incombuftible paper; and european paper, made of linen-rags.

Egyptian paper was principally ufed among the antients; being made of the papyrus or biblus, a fpecies of rufh, which grew on the banks of the Nile: in making it into paper, they began with lopping off the two extremes of the plant, the head and the root; the remaining part, which

was the ftem, they cut lengthwife into two nearly equal parts, and from each of thefe they ftripped the fcaly pellicles of which it confifted. The innermoft of thefe pellicles were looked on as the beft, and that neareft the rind as the worft: they were therefore kept apart, and made to conftitute two different forts of paper. As the pellicles were taken off, they extended them on a table, laying them over each other tranfverfely, fo as that the fibres made right angles; in this ftate they were glued together by the muddy waters of the Nile; or, when thofe were not to be had, with pafte made of the fineft wheat-flour, mixed with hot water and a fprinkling of vinegar. The pellicles were next preffed, to get out the water, then dried, and laftly flatted and fmoothed by beating them with a mallet: this was the egyptian paper, which was fometimes farther polifhed by rubbing it with a glafs-ball, or the like.

Bark-paper was only the inner whitifh rind, inclofed between the bark and the wood of feveral trees, as the maple, plane, beech, and elm, but efpecially the tilia, or linden-tree, which was that moftly ufed for this porpofe. On this, ftripped off, flatted, and dried, the antients wrote books, feveral of which are faid to be ftill extant.

Chinefe paper is of various kinds; fome is made of the rinds or barks of trees, efpecially the mulberry-tree and elm, but chiefly of the bambu and cotton-tree. In fact, almoft each province has its feveral paper. The preparations of paper made of the barks of trees, may be inftanced in that of the bambu, which is a tree of the cane or reed kind. The fecond fkin of the bark, which is foft and white, is ordinarily made ufe of for paper: this is beat in fair water to a pulp, which they take up in large moulds, fo that fome fheets are above twelve feet in length: they are completed, by dipping them, fheet by fheet, in alum-water, which ferves inftead of the fize among us, and not only hinders the paper from imbibing the ink, but makes it look as if varnifhed over. This paper is white, foft, and clofe, without the leaft roughnefs; tho' it cracks more eafily than european paper, is very fubject to be eaten by the worms, and its thinnefs makes it liable to be foon worn out.

Cotton-paper is a fort of paper which has been in ufe upwards of fix hundred years. In the french king's library are manufcripts on this paper, which appear to be of the Xth century; and from the XIIth century, cotton manufcripts are more frequent than parchment ones. Cotton-paper is ftill made in the Eaft-Indies, by beating cotton-rags to a pulp.

Linen or european paper appears to have been firft introduced among us towards the beginning of the XIVth century; but by whom this valuable commodity was invented, is not known. The method of making paper of linen or hempen-rags, is as follows: the linen-rags being carried to the mill, are firft forted; then wafhed very clean in puncheons, whofe fides are grated with ftrong wires, and the bottoms bored full of holes. After this they are fermented, by laying them in heaps clofe covered with facking, till they fweat and rot; which is commonly done in four or five days. When duly fermented, they are twifted into handfuls, cut fmall, and thrown into oval mortars, made of well-feafoned oak, about half a yard deep, with an iron-plate at bottom, an inch thick, eight inches broad, and thirty long: in the middle is a wafhing-block, grooved, with five holes in it, and a piece of hair-fieve faftened on the infide: this keeps the hammers from touching it, and prevents any thing going out except the foul water. Thefe mortars are continually fupplied with water, by little troughs, from a ciftern, fed by buckets fixed to the feveral floats of a great wheel, which raifes the wooden hammers, for pounding the rags in the mortars. When the rags are beaten to a certain degree, called the firft ftuff, the pulp is removed into boxes, made like corn-chandlers bins, with the bottom-board aflant, and a little feparation on the front, for the water to drain away. The pulp of the rags being in, they take away as many of the front-boards as are needful, and prefs the mafs down hard with their hands: the next day they put on another board, and add more pulp, till the box is full; and here it remains mellowing a week, more or lefs, according to the weather. After this, the ftuff is again put into clean mortars, and is beaten afrefh, and removed into boxes, as before; in which ftate it is called the fecond ftuff. The mafs is beat a third time, till fome of it being mixed with fair water, and brewed to and fro, appears like flour and water, without any

lumps

lumps in it; it is then fit for the pit-mortar, where it is perfectly diffolved, and is then carried to the vat, to be formed into fheets of paper. But lately, inftead of pounding the rags to a pulp with large hammers, as above, they make ufe of an engine, which performs the work in much lefs time. This engine confifts of a round folid piece of wood, into which are faftened feveral long pieces of fteel, ground very fharp. This is placed in a large trough with the rags, and a fufficient quantity of water. At the bottom of the trough is a plate with fteel bars, ground fharp like the former; and the engine being carried round with prodigious velocity, reduces the rags to a pulp in a very fhort time. It muft be obferved, that the motion of the engine caufes the water in the trough to circulate, and by that means conftantly returns the ftuff to the engine. The trough is conftantly fed with clean water at one end, while the dirty water from the rags is carried off at the other, thro' a hole, defended with wire-gratings, in order to hinder the pulp from going off with the dirty water.

When the ftuff is fufficiently prepared as above, it is carried to the vat, and mixed with a proper quantity of water, which they call priming the vat. The vat is rightly primed, when the liquor has fuch a proportion of the pulp, as that the mould, on being dipped into it, will juft take up enough to make a fheet of paper of the thicknefs required. The mould is a kind of fieve, exactly of the fize of the paper to be made, and about an inch deep, the bottom being formed of fine brafs-wire, guarded underneath with fticks, to prevent its bagging down, and to keep it horizontal; and further, to ftrengthen the bottom, there are large wires placed in parallel lines, at equal diftances, which form thofe lines vifible in all white paper, when held up to the light: the mark of the paper is alfo made in this bottom, by interweaving a large wire in any particular form. This mould the maker dips into the liquor, and gives it a fhake as he takes it out, to clear the water from the pulp. He then flides it along a groove to the coucher, who turns out the fheet upon a felt, laid on a plank, and lays another felt on it; and returns the mould to the maker, who by this time has prepared a fecond fheet, in another mould: and thus they proceed, laying alternately a fheet and a felt, till they have made fix quires of paper, which is called a poft; and this they do with fuch fwiftnefs, that, in many forts of paper, two men make twenty pofts, or more, in a day. A poft of paper being made, either the maker or coucher whiftles; on which four or five men advance, one of whom draws it under the prefs, and the reft prefs it with great force, till all the water is fqueezed from it; after which it is feparated, fheet by fheet from the felts, and laid regularly one fheet upon another; and having undergone a fecond preffing, it is hung up to dry. When fufficiently dried, it is taken off the lines, rubbed fmooth with the hands, and laid by till fized, which is the next operation. For this they choofe a fine temperate day, and having boiled a proper quantity of clean parchment or vellum-fhavings, in water, till it comes to a fize; they prepare a fine cloth, on which they ftrew a due proportion of white vitriol and roch-alum, finely powdered, and ftrain the fize through it, into a large tub; in which they dip as much paper at once as they can conveniently hold, and with a quick motion give every fheet its fhare of the fize, which muft be as hot as the hand can well bear it. After this, the paper is preffed, hung up fheet by fheet to dry; and being taken down, is forted, and what is only fit for outfide-quires, laid by themfelves: it is then told into quires, which are folded and preffed. The broken fheets are commonly put together, and two of the worft quires are placed on the outfide of every ream or bundle; and being tied up in wrappers, made of the fettling of the vat, it is fit for fale.

Paper is of various kinds, and ufed for various purpofes: with regard to colour, it is principally diftinguifhed into white, blue, and brown; and with regard to its dimenfions, into atlas, elephant, imperial, fuper-royal, royal, medium, demy, crown, fool's cap, and pot paper.

As englifh paper is, in general, as good as any we receive from abroad, a very high duty is laid on the importation of all foreign paper, which is more or lefs, according to the fize, the value, and the country from whence it is brought; thus royal atlas fine, and fine imperial paper, pay 1 l. 9 s. 8 $\frac{1}{4}$ d. the ream; fine genoa and dutch royal pay 17 s. 8 $\frac{1}{4}$ d. the ream; genoa and german crown and fool's cap paper pay about 2 s. 7 d. and genoa pot

pot pays 2 s. 2 ½ d. and for every 20 s. value, according to the book of rates, of paper brought from Rochelle, 6 s. No drawback is allowed on foreign paper exported.

Blotting PAPER, is paper not ſized, and into which ink readily ſinks: it is uſed in books, &c. inſtead of ſand, to prevent blotting; and alſo by apothecaries for filtring.

Teint, or *Demi-teint*-PAPER, is a paper uſed for deſigning on, and is either blue, brown, or biſtered.

Biſtered PAPER, is white paper waſhed over with a ſponge dipped in ſoot-water. Its uſe is to ſave the labour of the crayon in places which are to be ſhadowed the ſame depth as the teint of this paper: as to the light places, they are made with chalk.

Marbled PAPER. See MARBLING.

PAPER-OFFICE, an office in the palace of Whitehall, in which all the public writings, matters of ſtate and council, proclamations, letters, intelligences, negotiations abroad, and generally all diſpatches that paſs through the offices of the ſecretaries of ſtate, are lodged, by way of library.

PAPER-OFFICE is alſo an office belonging to the court of king's bench. See the article KING'S BENCH.

PAPHLAGONIA, an antient province of the leſſer Aſia, ſituated on the Euxine-ſea, now part of the province of Amaſia, in Turky.

PAPHOS, once an elegant city at the weſt end of the iſland of Cyprus; but the little town of Baffo is now all that remains of it.

PAPILIO, the BUTTERFLY, in zoology, a numerous genus of four-winged inſects, of the lepidoptera order, diſtinguiſhed by clavated antennæ.

The butterflies are ſo numerous, that authors commonly divide them into claſſes or ſubdiviſions, according to the number of their legs, ſome having ſix, and others only four legs, under each of which are comprehended a multitude of beautiful ſpecies, diſtinguiſhed by the different colours and variegations of their wings.

PAPILIONACEOUS, among botaniſts, an appellation given to the flowers of certain plants, from their reſembling the figure of a butterfly: they conſiſt of four petals, whereof that which covers the others, is called the vexillum; the two petals placed on each ſide, are called the alæ or the wings; and the loweſt petal is termed the carina, which is often divided into two portions. See plate XXXI. n° 10. and 22.

PAPILLA, the NIPPLE OF THE BREAST, in anatomy. See BREAST.

There are alſo papillæ of the ſkin and tongue. See CUTIS and TONGUE.

PAPIO, in zoology, the name uſed by ſome authors for thoſe monkeys, called in engliſh baboons. See MONKEY and BABOON.

PAPOUL, or ST. PAPOUL, a town of France, in the province of Languedoc, thirty-two miles ſouth-eaſt of Toulouſe.

PAPOUS, or NEW GUINEA, a large continent in the Pacific-ocean, a little ſouth of the equator; ſituated eaſt of the Spice-iſlands, in 130° eaſt long. but how far it extends farther to the eaſtward or ſouthward, is uncertain.

PAPPUS, in botany, a ſoft downy ſubſtance that grows on the ſeeds of certain plants, as thiſtles, hawkweed, &c. ſerving to ſcatter and buoy them up in the air.

PAPULÆ, a name uſed, by ſeveral authors, for eruptions on the ſkin of any ſort.

PAR, in commerce, ſignifies any two things equal in value; and in money-affairs, it is ſo much as a perſon muſt give of one kind of ſpecie, to render it juſt equivalent to a certain quantity of another.

In the exchange of money with foreign countries, the perſon to whom a bill is payable, is ſuppoſed to receive the ſame value as was paid the drawer by the remitter; but this is not always the caſe, with reſpect to the intrinſic value of the coins of different countries, which is owing to the fluctuation in the prices of exchange amongſt the ſeveral european countries, and the great trading cities. The par, therefore, differs from the courſe of exchange in this, that the par of exchange ſhews what other nations ſhould allow in exchange, which is rendered certain and fixed, by the intrinſic value of the ſeveral ſpecies to be exchanged: but the courſe ſhews what they will allow in exchange; which is uncertain and contingent, ſometimes more, and ſometimes leſs; and hence the exchange is ſometimes above, and ſometimes under par. See EXCHANGE.

PAR, in anatomy, a pair of the nerves. See the article NERVES.

PARABLE, a fable, or allegorical inſtruction, founded on ſomething real or apparent in nature or hiſtory, from which a moral is drawn, by comparing it with ſome-

ſomething in which the people are more immediately concerned: ſuch are the parables of Dives and Lazarus, of the Prodigal Son, of the Ten Virgins, *&c.* Kircher derives the uſe of parables from the Egyptians. Some make a difference between a parable and a fable; but Grotius and others uſe the two terms promiſcuouſly.

Parables are certainly a moſt delicate way of impreſſing diſagreeable truths on the mind, and in many caſes have the advantage of a more open reproof, and even of formal leſſons of morality: thus Nathan made David ſenſible of his guilt by a parable; and thus our Saviour, in attacking the prejudices of his countrymen, always ſpoke to them in parables.

PARABOLA, in geometry, a figure ariſing from the ſection of a cone, when cut by a plane parallel to one of its ſides. See the article CONIC SECTIONS.

To deſcribe a parabola in plano, draw a right line A B (plate CXCII. fig. 1.) and aſſume a point C without it; then in the ſame plane with this line and point place a ſquare rule D E F, ſo that the ſide D E may be applied to the right line A B, and the other E F turned to the ſide on which the point C is ſituated. This done, and the thread F G C, exactly of the length of the ſide of the rule, E F, being fixed at one end to the extremity of the rule F, and at the other to the point C, if you ſlide the ſide of the rule D E along the right line A B, and by means of a pin, G, continually apply the thread to the ſide of the rule, E F, ſo as to keep it always ſtretched as the rule is moved along, the point of this pin will deſcribe a parabola G H O.

Definitions. 1. The right line A B is called the directrix. 2. The point C is the focus of the parabola. 3. All perpendiculars to the directrix, as L K, M Θ, *&c.* are called diameters; the points, where theſe cut the parabola, are called its vertices; the diameter B I, which paſſes through the focus C, is called the axis of the parabola; and its vertex, H, the principal vertex. 4. A right line, terminated on each ſide by the parabola, and biſſected by a diameter, is called the ordinate applicate, or ſimply the ordinate, to that diameter. 5. A line equal to four times the ſegment of any diameter, intercepted between the directrix and the vertex where it cuts the parabola, is called the latus rectum, or parameter of that diameter. 6. A right line which touches the parabola only in one point, and being produced on each ſide falls without it, is a tangent to it in that point.

Prop. I. Any right line, as G E, drawn from any point of the parabola, G, perpendicular to A B, is equal to a line G C drawn from the ſame point to the focus. This is evident from the deſcription; for the length of the thread F G C being equal to the ſide of the rule E F, if the part F G, common to both, be taken away, there remains E G = G C. Q.E.D. The reverſe of this propoſition is equally evident, *viz.* that if the diſtance of any point from the focus of a parabola, be equal to the perpendicular drawn from it to the directrix, then ſhall that point fall in the curve of the parabola.

Prop. II. If from a point of the parabola, D, (*ibid.* fig. 2.) a right line be drawn to the focus, C; and another, D A, perpendicular to the directrix; then ſhall the right line D E, which biſſects the angle, A D C, contained between them, be a tangent to the parabola in the point D: a line alſo, as H K, drawn through the vertex of the axis, and perpendicular to it, is a tangent to the parabola in that point.

1. Let any point F be taken in the line D E, and let F A, F C, and A C be joined; alſo let F G be drawn perpendicular to the directrix. Then, becauſe (by prop. I.) D A = D C, D F common to both, and the ∠F D A = F D C, F C will be equal to F A; but F A ⪢ F G, therefore F C ⪢ F G, and conſequently the point F falls without the parabola: and as the ſame can be demonſtrated of every other point of D E, except D, it follows that D E is a tangent to the parabola in D. Q.E.D.

2. If every point of H K, except H, falls without the parabola, then is H K a tangent in H. To demonſtrate this, from any point K draw K L ⊥ A B, and join K C; then becauſe K C ⪢ C H = H B = K L, it follows that K C ⪢ K L, and conſequently that the point K falls without the parabola: and as this holds of every other point, except H, it follows that K H is a tangent to the parabola in H. Q.E.D.

Prop. III. Every right line, parallel to a tangent, and terminated on each ſide by the parabola, is biſſected by the diameter paſſing thro' the point of contact; that is,

it will be an ordinate to that diameter. For let E e (*ibid.* fig. 3 and 4.) terminating in the parabola in the points E, e, be parallel to the tangent D K; and let A D be a diameter passing through the point of contact D, and meeting E e in L; then shall E L = L e.

Let A D meet the directrix in A, and from the points E, e, let perpendiculars E F, ef, be drawn to the directrix; let C A be drawn, meeting E e in G; and on the center E, with the distance E C, let a circle be described, meeting A C again in H, and touching the directrix in F; and let D C be joined. Then because D A = D C, and ∟ A D K = ∟ C D K, it follows (4. 1.) that D K ⊥ A C; wherefore E e ⊥ A C, and C G = G H (3. 3.); so that e C = e H (4. 1.) and a circle described upon the center e, with the radius e C, must pass through H; and because e C = ef, it must likewise pass through f. Now because F f is a tangent to both these circles, and A H C cuts them, □ A F = ▭ C A H (36. 3.) = □ A f; therefore A F = A f, and F E, A L, and fe are parallel; and consequently L E = L e. Q. E. D.

Prop. IV. If from any point of a parabola, D (*ibid.* fig. 5.) a perpendicular, D H, be drawn to a diameter B H, so as to be an ordinate to it; then shall the square of the perpendicular, D H², be equal to the rectangle contained under the abscis H F, and the parameter of the axis, or to four times the rectangle H F B.

1. When the diameter is the axis; let D H ⊥ B C, join D C, and draw D A ⊥ A B, and let F be the vertex of the axis. Then, because H B = D A = D C, it follows that H B² = D C² = D H² + H C². Likewise, because B F = F C, H B² = 4 ▭ H F C + H C² (by 8. 2.). Wherefore D H² + H C² = 4 ▭ H F B + H C²; and D H² = 4 ▭ H F B; that is, D H² = the rectangle contained under the abscis H F, and the parameter of the axis.

2. When the diameter is not the axis: let E N (*ibid.* fig. 3 and 4.) be drawn perpendicular to the diameter A D, and E L an ordinate to it; and let D be the vertex of the diameter.

Then shall E N² = to the rectangle contained under the abscis L D, and the parameter of the axis. For let D K be drawn parallel to L E, and consequently a tangent to the parabola in the point D; and let it meet the axis in K: let E F ⊥ A B the directrix; and on the center E, with the radius E F, describe a circle, which will touch the directrix in F, and pass through the focus C: then join A C, which will meet the circle again in H, and the right lines D K, L E, in the points P, G; and, finally, let L E meet the axis in O.

Now since the angles C P K, C B A are right, and the angle B C P common, the triangles C B A, C P K are equiangular; and A C : C B (or C K : C P) :: O K : G P; and A C × G P = O K × C B. Again, because C A = 2 C P, and C H = 2 C G, A H = 2 G P; and consequently the ▭ C A H = $\overline{\text{C A} \times 2\,\text{G P}}$ = $\overline{\text{O K} \times 2\,\text{C B}}$. But, E N² = F A² = $\overline{▭\ \text{C A H}}$; and consequently, E N² = $\overline{\text{O K} \times 2\,\text{C B}}$ = the ▭ contained under the abscis, L D, and the parameter of the axis. Q. E. D.

Hence, 1. The squares of the perpendiculars, drawn from any points of the parabola to any diameters, are to one another as the abscissæ intercepted between the vertices of the diameters and the ordinates applied to them from the same points.

2. The squares of the ordinates, applied to the same diameter, are to each other as the abscissæ between each of them and the vertex of the diameter. For let E L, Q R (*ibid.* fig. 3. 4.) he ordinates to the same diameter D N; and let E N, Q S be perpendiculars to it. Then, on account of the equiangular triangles E L N, Q R S, E L² : Q R² :: E N² : Q S²; that is, as the abscis D L to the abscis D R.

Prop. V. If from any point of a parabola E (*ibid.* fig. 3 and 4.) an ordinate E L be applied to the diameter A D; then shall the square of E L be equal to the rectangle contained under the abscis D L, and the latus rectum or parameter of that diameter.

For, since Q R = D K, Q R² will be equal to D M² + M K²; but (by case 1. of prop. 4.) D M² = 4 ▭ M Q B; and because M Q = Q K, M K² = 4 M Q²: wherefore Q R² = 4 ▭ M Q B + 4 M Q²; that is, to 4 ▭ Q M B. But M Q = Q K = D R, and M B = D A; wherefore Q R² = 4 ▭ R D A: and because Q R, E L are ordinates to the diameter A D, Q R² (by cor. 2. of prop. 4.) : E L² (:: R D : L D) :: 4 ▭ R D A : 4 ▭ L D A. Therefore E L² = 4 ▭ L D A, or the rectangle contained under the abscis L D, and

and the parameter of the diameter A D: and from this property, Apollonius called the curve a parabola. Q. E. D.

Prop. VI. If from any point of a parabola, A (*ibid.* fig. 6.) there be drawn an ordinate, A C, to the diameter B C; and a tangent to the parabola in A, meeting the diameter in D: then shall the segment of the diameter, C D, intercepted between the ordinate and the tangent, be bissected in the vertex of the diameter B. For let B E be drawn parallel to A D, it will be an ordinate to the diameter A E; and the abscifs B C will be equal to the abscifs A E, or B D. Q. E. D.

Hence, if A C be an ordinate to B C, and A D be drawn so as to make B D $=$ D C, then is A D a tangent to the parabola. Also the segment of the tangent, A D, intercepted between the diameter and point of contact, is bissected by a tangent B G, passing through the vertex of D C.

Cartesian PARABOLA, is a curve of the second order, expressed by the equation $xy = ax^3 + bx^2 + cx + d$, containing four infinite legs, *viz.* two hyperbolic ones, M M, B m, (plate CXCII. fig. 7.) (A E being the asymptote) tending contrary ways, and two parabolic legs B N, M N joining them, being the sixty-sixth species of lines of the third order, according to Sir Isaac Newton, called by him a trident: it is made use of by Des Cartes, in the third book of his Geometry, for finding the roots of equations of six dimensions by its intersections with a circle. Its most simple equation is $xy = x^3 + a^3$, and the points through which it is to pass, may be easily found by means of a common parabola, whose abscifs is $ax^2 + bx + c$, and an hyperbola whose abscifs is $\frac{d}{x}$; for y will be equal to the sum or difference of the correspondent ordinates of this parabola and hyperbola.

Diverging PARABOLA, a name given by Sir Isaac Newton to five different lines of the third order, expressed by the equation $yy = ax^3 + bx^2 + cx + d$.

Quadrature of the PARABOLA. See the article QUADRATURE.

PARABOLAN, *parabolanus*, in antiquity, a kind of gladiator, who rushed upon death. See the article GLADIATOR.

PARABOLIC ASYMPTOTE, in geometry, is used for a parabolic line approaching to a curve, so that they never meet; yet, by producing both indefinitely, their distance from each other becomes less than any given line. Mac Laurin observes, that there may be as many different kinds of these asymptotes as there are parabolas of different orders. See PARABOLA and ASYMPTOTE.

When a curve has a common parabola for its asymptote, the ratio of the subtangent to the abscifs approaches continually to the ratio of two to one, when the axis of the parabola coincides with the base; but this ratio of the subtangent to the abscifs approaches to that of one to two, when the axis is perpendicular to the base. And by observing the limit to which the ratio of the subtangent and abscifs approaches, parabolic asymptotes of various kinds may be discovered.

PARABOLIC CONOID, in geometry, a solid generated by the rotation of a parabola about its axis: its solidity is $= \frac{1}{2}$ of that of its circumscribing cylinder.

The circles, conceived to be the elements of this figure, are in arithmetical proportion, decreasing towards the vertex.

A parabolic conoid is to a cylinder of the same base and height, as 1 to 2, and to a cone of the same base and height, as $1\frac{1}{2}$ to 1. See the article GAUGING.

PARABOLIC CUNEUS, a solid figure formed by multiplying all the D B's (plate CXCII. fig. 8.) into the D S's; or, which amounts to the same, on the base A P B erect a prism, whose altitude is A S; this will be a parabolical cuneus, which of necessity will be equal to the parabolical pyramidoid, as the component rectangles in one are severally equal to all the component squares in the other.

PARABOLIC PYRAMIDOID, a solid figure generated by supposing all the squares of the ordinate applicates in the parabola so placed, as that the axis shall pass through all the centers at right angles; in which case, the aggregate of the planes will form the parabolic pyramidoid.

The solidity hereof is had by multiplying the base by half the altitude, the reason of which is obvious; for the component planes being a series of arithmetical proportionals beginning from o, their sum will be equal to the extremes multiplied by half the number of terms.

PARABOLIC SPACE, the area contained between any entire ordinate as V V (plate CXCII. fig. 9.) and the curve of the incumbent parabola.

The parabolic space is to the rectangle of the semi-ordinate into the abscifs, as 2 to 3; to a triangle inscribed on the ordinate as a base, it is as 4 to 3.

Every parabolical and paraboloidical space is to the rectangle of the semiordinate into the abscis, as $rxy(m+r)$ to xy; that is, as r to $m+r$.

Segment of a PARABOLIC SPACE, is that space included between two ordinates.

PARABOLIC SPINDLE, in gauging; a cask of the second variety is called the middle frustum of a parabolic spindle.

The parabolic spindle is eight-fifteenths of its circumscribing cylinder.

PARABOLOIDES, a name given to parabolas of the higher kind, which are algebraic curves. See the article CURVE.

PARACENTESIS, an operation in surgery, commonly called tapping.

In a paracentesis of the abdomen, in order to discharge the water contained in dropsical subjects, the best method is to lay the patient on the side of his bed, and to insert the trocar into the lower and lateral part of the cavity of the abdomen, at or about the distance of eight fingers-breadth from the navel, or in the middle of the space between the navel and the angle of the os ilium, and after drawing out the sharp pointed bodkin from the cannula, which is left in the wound, so much of the water may be drawn off at a time as the patient can well bear; and if the patient does not grow faint, the whole quantity may be drawn off at once. In order to keep him from fainting, the surgeon, or his assistant, must press both his hands on each side of the abdomen during the operation; or a broad linnen-swath perforated in the middle, may be put round the abdomen, and gradually drawn tighter till all the water is evacuated; after which a flannel-compress, dipped in spirits of wine, may be placed on the wound, and retained by a tight roller. If the patient can only bear to have a few pounds of water taken at a time, as the wound is but small and almost closes of itself, it may be dressed only with a couple of square compresses, a plaster and bandage; and if his strength will permit, the operation may be repeated the next day on the other side of the abdomen; and so on the third day, about two fingers-breadth from the last perforation: fresh wounds are made, rather than to keep open the first, because wounds kept open in hydropical subjects, are in danger of mortifying.

In a paracentesis of the thorax, to discharge water, blood, matter, or such other preternatural substances as are there lodged, it is necessary to consider, before the operation, in which side of the thorax the matter is contained, and what part of that cavity is most proper to be perforated. In order to discover the first, the surgeon should learn in which side the patient has before had any pain or inflammation; in what part he perceives the weight and fluctuation of matter; on which side he can lie easier than on the other: for that is usually the side affected; the person not being able to lie on the sound side, because of the weight or pressure of the matter on the mediastinum; and, lastly, he may generally perceive some tumour, or inflammatory heat on the side affected. Having discovered which side of the thorax is to be perforated, the operation may then be safely performed between the second and third of the spurious ribs on the left side, or between the third and fourth on the right side, counting from below upwards, so as to be about five or six fingers-breadth from the spine of the back, and as much below the angle of the scapula. The surgeon having marked the described place with ink, and taken up the integuments between his own fingers and those of an assistant, as in cutting issues, he makes an incision about two inches long, according to the course of the ribs; then cautiously divides the intercostal muscles and pleura by a transverse incision with the scalpel; and having introduced the cannula, the contained humours of the thorax are thereby discharged. During the operation the patient should be retained in an inclined posture, by which means the ribs will be elevated more from each other, and a large space made for the incision; and a sufficient opening being made in the thorax, the finger is then to be introduced, in order to separate the lungs from its adhesions to the pleura, and to make way for the peccant humours. After these are discharged, the orifice of the wound is to be stopped with a piece of soft linen rag rolled up, by which it may be kept open for future discharges; but over the orifice of the wound is to be applied soft lint, fastened with thread, and over that a plaster, compress and bandage. The dressing may afterwards be made once or twice a day, discharging and washing out the matter by injecting a decoction of vulnerary herbs. These injections should be continued till they are observed to return

turn clean, and unmixed with bloody or purulent matter, which is a ſign the parts are healed; on which the convoluted linen-rag and lint may be withdrawn, and the reſt of the cure completed, as directed under wounds of the thorax.

For the method of performing a paracenteſis of the ſcrotum, ſee HYDROCELE.

PARACENTRIC MOTION, in aſtronomy, denotes ſo much as a revolving planet approaches nearer to, or recedes from, the ſun, or center of attraction. Thus $SB - SA = bB$ (plate CXCIII. fig. 4.) is the paracentric motion of the planet A.

PARACENTRIC *ſolicitation of gravity*, is much the ſame with the centripetal force; and, in aſtronomy, is expreſſed by the line AL *(ibid.)* drawn from the point A parallel to the ray SB, infinitely near SB, till it interſect the tangent BL.

PARACLET, the COMFORTER, a name given to the Holy Ghoſt. See the article TRINITY.

PARACYNANCHE, or PARASYNANCHE. See the article PARASYNANCHE.

PARADE, the placing any thing to public view, with all its advantages and ornaments.

PARADE, in war, is a place where the troops meet to go upon guard, or any other ſervice.

In a garriſon where there are two, three, or more regiments, each have their parade appointed, where they are to meet upon all occaſions, eſpecially upon any alarm. And in a camp, all parties, convoys, and detachments have a parading place appointed them at the head of ſome regiment.

PARADE, in fencing, is the action of parrying or turning off any thruſt. See the article PARRYING.

PARADIGM, an example or inſtance of ſomething ſaid or done.

PARADISE, a term principally uſed for the garden of Eden, in which Adam and Eve were placed immediately upon their creation.

As to this terreſtrial paradiſe, there have been many enquiries about its ſituation. It has been placed in the third heaven, in the orb of the moon, in the moon itſelf, in the middle region of the air, above the earth, under the earth, in the place poſſeſſed by the Caſpian ſea, and under the arctic pole. The learned Huetius places it upon the river that is produced by the conjunction of the Tigris and Euphrates, now called the river of the Arabs, between this conjunction and the diviſion made by the ſame river before it falls into the Perſian ſea. Other geographers have placed it in Armenia, between the ſources of the Tigris, the Euphrates, the Araxis, and the Phaſis, which they ſuppoſe to be the four rivers deſcribed by Moſes.

The celeſtial paradiſe is that place of pure and refined delight, in which the ſouls of the bleſſed enjoy everlaſting happineſs. In this ſenſe it is frequently uſed in the New Teſtament: our Saviour tells the penitent thief on the croſs, "This day ſhalt thou be with me in paradiſe:" and St. Paul ſpeaking of himſelf in the third perſon, ſays, "I knew a man who was caught up into paradiſe, and heard unſpeakable words, which it is not lawful for a man to utter."

Mahomet has promiſed his followers a paradiſe of mere ſenſual delights.

Bird of PARADISE, *paradiſæa*, in ornithology, a genus of birds of the order of the picæ, the beak of which is of a cultratotubulated form, and acute; the forehead is gibbous, and the two middle feathers are extremely long, and very firm.

Of this genus there are a great many elegant ſpecies. 1. The greater bird of paradiſe, about the ſize of a black-bird; in which, what may be called the two middle feathers of the tail, ſpring from the rump, and are only the ſtems of feathers without the web.

2. The ſuppoſed king of the greater birds of paradiſe; being about the ſize of a chaffinch, only that the bill is longer, and the legs ſtronger in proportion: it has a very ſhort tail, from the middle of which ſpring two rigid ſtems of feathers, which at the points are beſet with a web on one ſide, and curled.

3. The pyed and creſted bird of paradiſe, with two extraordinary long tail-feathers: it is nearly of the ſize of the ſecond ſpecies.

PARADOX, in philoſophy, a propoſition ſeemingly abſurd, as being contrary to ſome received opinion; but yet true in fact.

No ſcience abounds more with parodoxes than geometry: thus, that a right line ſhould continually aproach to the hyperbola, and yet never reach it, is a true paradox; and in the ſame manner, a

ſpiral

ſpiral may continually approach to a point, and yet not reach it, in any number of revolutions, however great.

PARÆA, ÆSCULAPIUS'S SERPENT, in zoology, a ſpecies of coluber, with the ſcuta of the abdomen one hundred and ninety, and the ſquamæ of the tail forty-two. See the article COLUBER.

PARAGE, in law, an equality of blood or dignity, but eſpecially of land, in the partition of an inheritance between coheirs. See the article HEIR.

PARAGOGE, in grammar, a figure whereby a letter or ſyllable is added to the end of a word; as *med*, for *me*; *dicier*, for *dici*, &c.

PARAGORICS, or PAREGORICS. See the articles PAREGORICS.

PARAGOYA, one of the Philippine iſlands, a little north of Borneo.

PARAGRAPH, in general, denotes a ſection or diviſion of a chapter, and in references is marked thus ¶.

PARAGUAY, or LA PLATA, a province of South America, ſubject to Spain, lies between 12° and 37° ſouth lat. and between 50° and 75° weſt long.

The paraguay-tea, ſo much valued in Peru, Chili, and other parts of South America, is the produce of a ſhrub, the genus of which is not known: its leaves are ſaid to be like thoſe of ſena, and infuſed in hot-water, yield a tea not unlike that obtained from the oriental kind. See the article TEA.

PARAIBA, the moſt northern province of Braſil, ſituated on the ſouth-ſide of the mouth of the river Amazon.

PARALEPSIS, παράλειψις, in rhetoric, the pretence of paſſing over a thing, and yet mentioning it by the bye.

PARALIPOMENA, παραλειπόμενα, in matters of literature, denotes a ſupplement of things omitted in a preceding work.

The two books of Chronicles, in the canon of the ſcripture, are often termed paralipomena, as being a kind of ſupplement to thoſe of Kings. See the articles CHRONICLES and KINGS.

PARALLACTIC, in general, ſomething relating to the parallax of heavenly bodies. See the article PARALLAX.

The parallactic angle of a ſtar, *&c.* is the difference of the angles C E A, (plate CXCIII. fig. 5. n° 1.) B T A, under which its true and apparent diſtance from the zenith is ſeen; or, which is the ſame thing, it is the angle T S E.

The ſines of the parallactic angles A L T, A S T (*ibid.* n° 2.) at the ſame or equal diſtances, Z S, from the zenith, are in the reciprocal ratio of the diſtances T L, and T S, from the center of the earth.

PARALLACTIC MACHINE, that repreſented in plate CXCIII. fig. 6. n° 1. the uſe of which is to find, at any hour of the day, a ſtar whoſe declination and right aſcenſion is given. Its conſtruction is thus: upon the frame A B D C ſtands two pieces of wood K S, O R, placed obliquely; theſe ſupport a kind of trapezium S 1 2 G, formed likewiſe of wood: in the middle of this trapezium is a cylindrical wooden axis, which at one end reſts upon the ſide 1 2, and at the other end upon the ſide S G; both which are perforated for this purpoſe. The lower end of this axis coincides with the center of a circle delineated upon the piece 1 2, as repreſented *ibid.* n° 2. this circle is furniſhed with an index, that moves round it, in proportion as the axis turns. The upper end of the axis is placed between two concave ſemi-circles N, Q, which may be ſcrewed together in ſuch a manner, as to allow the end of the axis only ſufficient room to move: one of theſe ſemi-circles is graduated; and this end of the axis ſuſtains the piece of wood X Z, hollowed ſo as to receive the teleſcope L L, and with a channel cut in it ſo as to move upon the axis; the degrees of which movement are marked by an index, that turns round the ſemi-circle N Q. This axis has, by this means, two motions, one from right to left about the point 3, and the other up and down about the point 4; the former being from eaſt to weſt, when the machine is properly placed, and the other from ſouth to north.

In order to adjuſt the machine, the angle formed by the axis and the vertical S V, muſt be equal to the elevation of the pole at the place where the obſervation is made: then the machine is to be placed in the ſituation E F, ſo that the axis G 3 may coincide with the meridian of the place. Then the teleſcope is moved up and down, till the index 4 mark upon the ſemi-circle 5 *o* 6 the degree of the declination of the ſtar; which ought to be from *o* towards 6, when the declination is ſouthern; and from *o* towards 5, when the declination is northern. Then, by means of the right aſcenſion, find when the ſtar will be on the meridian: and converting the time between noon and the hour given into degrees, this will give

give the afcenfional difference; which muft be marked by turning the axis of the machine, till the index 3 ftands over the degree of right afcenfion, which fhould be from 0 towards 2, when the ftar is not arrived at the meridian; and from 0 towards 1, when it hath paffed the meridian. In this fituation of the machine, the center of the telefcope will be directed towards the ftar fought, which may be thus feen even in the day-time.

PARALLAX, παράλλαξις, in aftronomy, denotes a change of the apparent place of any heavenly body, caufed by being feen from different points of view; or it is the difference between the true and apparent diftance of any heavenly body from the zenith.

Thus let A B (plate CXCIII. fig. 7.) by a quadrant of a great circle on the earth's furface, A the place of the fpectator, and the point V in the heavens the vertex and zenith. Let V N H reprefent the ftarry firmament, A D the fenfible horizon, in which fuppofe the ftar C to be feen, whofe diftance from the center of the earth is T C. If this ftar were obferved from the center T, it would appear in the firmament in E, and elevated above the horizon by the arch D E: this point E is called the true place of the phænomenon or ftar. But an obferver viewing it from the furface of the earth at A, will fee it at D, which is called its vifible or apparent place; and the arch D E, the diftance between the true and vifible place, is what aftronomers call the parallax of the ftar, or other phænomenon.

If the ftar rife higher above the horizon to M, its true place vifible from the center is P, and its apparent place N; whence its parallax will be the arch P N, which is lefs than the arch D E. The horizontal parallax, therefore, is the greateft; and the higher a ftar rifes, the lefs is its parallax; and if it fhould come to the vertex or zenith, it would have no parallax at all: for when it is in Q, it is feen both from T and A in the fame line T A V, and there is no difference between its true and apparent or vifible place. Again, the farther a ftar is diftant from the earth, fo much the lefs is its parallax: thus the parallax of the ftar F is only G D, which is lefs than D E the parallax of C. Hence it is plain, that the parallax is the difference of the diftances of a ftar from the zenith when feen from the center and from the furface of the earth: for the true diftance of the ftar M from the zenith is the arch V P, and its apparent diftance V N, the difference between which P N is the parallax.

Thefe diftances are meafured by the angles V T M, and V A M, but V A M — V T M = T M A. For the external angle V A M = ∟A T M + ∟A M T, the two inward and oppofite angles; fo that A M T meafures the parallax, and upon that account is itfelf frequently called the parallax: and this is always the angle under which the femi-diameter of the earth A T, appears to an eye placed in the ftar; and therefore where this femi-diameter is feen directly, there the parallax is greateft, *viz.* in the horizon. When the ftar rifes higher, the fine of the parallax is always to the fine of the ftar's diftance from the zenith, as the femi-diameter of the earth to the diftance of the ftar from the earth's center: hence if the parallax of a ftar be known at any one diftance from the zenith, we can find its parallax at any other diftance.

If we have the diftance of a ftar from the earth, we can eafily find its parallax: for on the triangle T A C (*ibid.*) rectangular at A, having the femi-diameter of the earth, and T C the diftance of the ftar, the angle A C T, which is the horizontal parallax, is found by trigonometry; and, on the other hand, if we have this parallax, we can find the diftance of the ftar; fince in the fame triangle, having A T, and the ∟A C T, the diftance T C may be eafily found.

Aftronomers, therefore, have invented feveral methods for finding the parallaxes of ftars, in order thereby to difcover their diftances from the earth. However, the fixed ftars are fo remote as to have no fenfible parallax; and even the fun, and all the primary planets, except mars and venus when in perigee, are at fo great diftances from the earth, that their parallax is too fmall to be obferved. In the moon, indeed, the parallax is found to be very confiderable, which in the horizon amounts to a degree or more, and may be found thus: in an eclipfe of the moon, obferve when both its horns are in the fame vertical circle, and at that inftant take the altitudes of both horns: the difference of thefe two altitudes being halved and added to the leaft, or fubtracted from the greateft, gives nearly the vifible or apparent altitude of the moon's center; and the true altitude is

is nearly equal to the altitude of the center of the ſhadow at that time. Now we know the altitude of the ſhadow, becauſe we know the place of the ſun in the ecliptic, and its depreſſion under the horizon, which is equal to the altitude of the oppoſite point of the ecliptic in which is the center of the ſhadow. And therefore having both the true altitude of the moon and the apparent altitude, the difference of theſe is the parallax required. But as the parallax of the moon increaſes as ſhe approaches towards the earth, or the perigæum of her orbit; therefore aſtronomers have made tables, which ſhew the horizontal parallax for every degree of its anomaly.

The parallax always diminiſhes the altitude of a phænomenon, or makes it appear lower than it would do, if viewed from the center of the earth; and this change of the altitude may, according to the different ſituation of the ecliptic and equator in reſpect of the horizon of the ſpectator, cauſe a change of the latitude, longitude, declination and right aſcenſion of any phænomenon, which is called their parallax. The parallax, therefore, increaſes the right and oblique aſcenſion; diminiſhes the deſcenſion; diminiſhes the northern declination and latitude in the eaſtern part, and increaſes them in the weſtern; but increaſes the ſouthern both in the eaſtern and weſtern part; diminiſhes the longitude in the weſtern part, and increaſes it in the eaſtern. Hence it appears, that the parallax has juſt oppoſite effects to refraction. See the article REFRACTION.

Annual PARALLAX, the change of the apparent place of a heavenly body, which is cauſed by being viewed from the earth in different parts of its orbit round the ſun. See the article EARTH.

The annual parallax of all the planets is found very conſiderable, but that of the fixed ſtars is imperceptible. See STAR.

PARALLAX, in levelling, denotes the angle contained between the line of the true level, and that of the apparent level.

PARALLEL, in geometry, an appellation given to lines, ſurfaces, and bodies every where equidiſtant from each other; and which, though infinitely produced, would never meet: thus the line O P, (plate CXCIV. fig. 1.) is parallel to Q R.

Geometricians demonſtrate, that if two parallels, O P and Q R (*ibid.*) be cut by a tranſverſe line S T in A and B; 1. The alternate angles x and y are equal. 2. The external angle u is equal to the internal oppoſite one y. And, 3. The two internal oppoſite ones x and s, are alſo equal to two right angles.

It is ſhewn on the principles of optics, that if the eye be placed between two parallel lines, they will appear to converge towards a point oppoſite to the eye. And if they run to ſuch a length, as that the diſtance between them be but as a point thereto, they will there appear to coincide.

Parallel lines are deſcribed by letting fall equal perpendiculars, and drawing lines through the extremes.

PARALLEL PLANES, are ſuch planes as have all the perpendiculars drawn betwixt them equal to each other.

PARALLEL RAYS, in optics, are thoſe which keep at an equal diſtance from the viſible object to the eye, which is ſuppoſed to be infinitely remote from the object.

PARALLEL RULER, or PARALLELISM, an inſtrument conſiſting of two wooden, braſs, &c. rulers A B, C D (*ibid.* fig. 4.) equally broad every where; and ſo joined together by the croſs blades E F and G H, as to open to different intervals, accede and recede, and yet ſtill retain their paralleliſm.

The uſe of this inſtrument is obvious; for one of the rulers being applied to R S, and the other withdrawn to a given point V, a right line A B, drawn by its edge through V, is a parallel to R S.

PARALLELS, or PARALLEL CIRCLES, in geography, called alſo parallels, or circles of latitude, are leſſer circles of the ſphere conceived to be drawn from weſt to eaſt, through all the points of the meridian, commencing from the equator to which they are parallel, and terminating with the poles.

They are called parallels of latitude, becauſe all places lying under the ſame parallel, have the ſame latitude.

PARALLELS *of latitude*, in aſtronomy, are leſſer circles of the ſphere parallel to the ecliptic, imagined to paſs through every degree and minute of the colures.

They are repreſented on the globe by the diviſions on the quadrant of altitude, in its motion round the globe, when ſcrewed over the pole of the ecliptic. See the article GLOBE.

PARALLELS *of altitude*, or ALMUCANTARS, are circles parallel to the horizon, imagined to paſs through every degree and minute of the meridian between the horizon

horizon and zenith, having their poles in the zenith.

They are reprefented on the globe by the divifions on the quadrant of altitude, in its motion about the body of the globe, when fcrewed to the zenith.

PARALLELS *of declination*, in aftronomy, are the fame with parallels of latitude in geography.

PARALLEL SPHERE, that fituation of the fphere, wherein the equator coincides with the horizon, and the poles with the zenith and nadir. See SPHERE.

In this fphere all the parallels of the equator become parallels of the horizon, confequently, no ftars ever rife or fet, but all turn round in circles parallel to the horizon; and the fun when in the equinoctial, wheels round the horizon the whole day. After his rifing to the elevated pole, he never fets for fix months; and after his entering again on the other fide of the line, never rifes for fix months longer.

This is the pofition of the fphere to fuch as live under the poles, and to whom the fun is never above 23° 30′ high.

PARALLEL SAILING, in navigation, is the failing under a parallel of latitude. See the article NAVIGATION.

PARALLELEPIPED, or PARALLELOPIPED, in geometry, a regular folid comprehended under fix parallelograms, the oppofite ones whereof are fimilar, parallel, and equal, as in plate CXCIV. fig. 3.

All parallelepipeds, prifms, cylinders, &c. whofe bafes and heights are equal, are themfelves equal.

A diagonal plane divides a parallelepiped into two equal prifms; fo that a triangular prifm is half a parallelepiped upon the fame bafe, and of the fame altitude.

All parallelepipeds, prifms, cylinders, &c. are in a ratio compounded of their bafes and altitudes: wherefore, if their bafes be equal, they are in proportion to their altitudes; and converfely.

All parallelepipeds, cylinders, cones, &c. are in a triplicate ratio, of their homologous fides, and alfo of their altitudes.

Equal parallelepipeds, prifms, cones, cylinders, &c. reciprocate their bafes and altitudes.

To meafure the furface and folidity of a parallelepiped.

Find the areas of the parallelogram, ILMK, LMON, and OMKP (*ibid.*) add thefe into one fum, and multiply that fum by 2, the factum will be the furface of the parallelepiped.

If then the bafe ILMK be multiplied by the altitude MO, the product will be the folidity.

PARALLELISM, the fituation or quality whereby any thing is denominated parallel. See the article PARALLEL.

PARALLELISM *of the earth's axis*, in aftronomy, that fituation of the earth's axis, in its progrefs through its orbit, whereby it is ftill directed towards the pole-ftar; fo that if a line be drawn parallel to its axis, while in any one pofition, the axis, in all other pofitions, will be always parallel to the fame line.

This parallelifm is the refult of the earth's double motion, *viz.* round the fun, and round its own axis; or its annual and diurnal motion; and to it we owe the viciffitudes of feafons, and the inequality of day and night. See the article EARTH.

PARALLELISM *of the rows of trees*. Thefe are never feen parallel, but always inclining to each other towards the farther extreme. Hence mathematicians have taken occafion to enquire in what lines the trees muft be difpofed to correct this effect of the perfpective, and make the rows ftill appear parallel. The two rows muft be fuch, as that the unequal intervals of any two oppofite or correfpondent trees may be feen under equal vifual rays.

On this principle, fome have fhewn that the two rows of trees muft be two oppofite femi-hyperbolas; but Mr. Varignon, in Mem. de l'Acad. ann. 1717, renders the problem much more general, and requires not only that the vifual angles be equal, but to have them increafe or decreafe in any given ratio, provided the greateft do not exceed a right angle. The eye he requires to be placed in any point, either juft at the beginning of the ranges, beyond or on this fide.

He fuppofes the firft row to be a right line, and feeks what line the other muft be, which he calls the curve of the range: this he finds muft be an hyperbola to have the vifual angles equal. The ftraight and hyperbolical rows will be feen parallel to infinity; and if the oppofite femi hyperbola be added, we fhall have three rows of trees, the ftraight one in the middle, and all three parallel.

It is fufficient that this fecond hyperbola have the fame center, its vertex in the fame right line, and the fame conjugate axis. Thus the two hyperbola's may be of all the different kinds poffible, yet all have the fame effect.

If it be required to have the trees appear under decreafing angles, the ftraight row being laid down as before, he fhews, that if the decreafe be in a certain ratio, the other line muft be a parallel ftraight line. But he goes yet farther, and fuppofing the firft row any curve whatever, he feeks for another that fhall make the rows have any effect defired.

PARALLELOGRAM, in geometry, a quadrilateral right-lined figure, whofe oppofite fides are parallel and equal to each other. It is generated by the equable motion of a right line always parallel to itfelf. When it has all its four angles right, and only its oppofite fides equal, it is called a rectangle or oblong. When the angles are all right, and the fides equal, it is called a fquare. If all the fides are equal, and the angles unequal, it is called a rhombus or lozenge: and if the fides and angles be unequal, it is called a rhomboides.

Properties of the PARALLELOGRAM. In every parallelogram of what kind foever, as A B C D (plate CXCIV. fig. 2.) a diagonal D A divides it into two equal parts; the angles diagonally oppofite B, C, and A, D, are equal; the oppofite angles of the fame fide C, D, and A, B, *&c.* are together equal to two right angles; and each two fides, together, greater than the diagonal.

Two parallelograms A B C D, and E C D F, on the fame or equal bafe C D, and of the fame height A C, or between the fame parallels A F, C D, are equal: and hence two triangles C D A, and C D F, on the fame bafe and of the fame height, are alfo equal. Hence, alfo, every triangle C F D is half a parallelogram A C D B upon the fame or an equal bafe C D, and of the fame altitude, or between the fame parallels. Hence, alfo, a triangle is equal to a parallelogram, having the fame bafe, and half the altitude, or half the bafe, and the fame altitude.

Parallelograms, therefore, are in a given ratio compounded of their bafes and altitudes. If then the altitudes be equal, they are as the bafes, and converfely.

In fimilar parallelograms and triangles, the altitudes are proportional to the homologous fides, and the bafes are cut proportionably thereby. Hence fimilar parallelograms and triangles are in a duplicate ratio of their homologous fides; as alfo of their altitudes, and the fegments of their bafes; they are, therefore, as the fquares of the fides, altitudes, and homologous fegments of the bafes.

In every parallelogram, the fum of the fquares of the two diagonals is equal to the fum of the fquares of the four fides. For if the parallelogram be rectangular, it follows, that the two diagonals are equal; and, confequently, the fquare of a diagonal, or, which comes to the fame thing, the fquare of the hypothenufe of a right angle, is equal to the fquares of the fides.

If the parallelogram be not rectangular, and of confequence the two diagonals be not equal, which is the moft general cafe, the propofition becomes of vaft extent; for inftance, in the whole theory of compound motions, *&c.* There are three ways of demonftrating this problem; the firft by trigonometry, which requires twenty one operations; the fecond geometrical and analytical, which requires fifteen. M. de Lagny gives the third method in the Mem de l'Acad. which only requires feven.

To find the area of the rectangled PARALLELOGRAM A B C D; find the length of the fides A B and A C; multiply A C fuppofed = 345 into A B, = 123, the produce will be the area of the parallelogram, namely, 11385. Hence, 1. Rectangles are in a ratio compounded of their fides A C and A B 2. If, therefore, three lines be continually proportional, the fquare of the middle one is equal to the rectangle of the two extremes: and, if four lines be proportional, the rectangle under the two extremes is equal to that under the two middle terms.

Other parallelograms, not rectangular, have their areas found by refolving them, by diagonals, into two triangles, and adding the areas of the feparate triangles into one fum.

PARALLELOGRAM, or PARALLELISM, a machine for the ready reduction of defigns; it is the fame with the pentagraph. See the article PENTAGRAPH.

PARALLELOPIPED. See the article PARALLELEPIPED.

PARALLELOPIPEDIA, in natural hiftory, the name of a genus of fpars, thus called, becaufe regularly of a parallelopiped form. See the article SPAR.

They are pellucid cryftaline fpars externally of a determinate and regular figure, always found loofe, detached, and

and ſeparate from all other bodies, and in form of an oblique parallelopiped, with ſix parallelogram ſides and eight ſolid angles, eaſily fiſſile, either in an horizontal or perpendicular direction, being compoſed of numbers of thin plates, and thoſe of very elegantly and regularly arranged bodies, each of the ſame form with the whole maſs, except that they are thinner in proportion to their horizontal planes; and naturally fall into theſe and no other figures, on being broken with a ſlight blow. Of this genus there are four known ſpecies. 1. The hard, pellucid, and colourleſs one, called the iſland-cryſtal of authors. See the article ISLAND-CRYSTAL.

2. A dull and whitiſh kind, found in France, Germany, and England, particularly in the Derbyſhire and Yorkſhire lead-mines, and about Scarborough. This has the ſame property with the former, of giving a double refraction; but it is ſo dull and opake, that it does not ſhew it ſo elegantly. 3. A ſoft, whitiſh, and very bright one, found principally in the lead-mines of Yorkſhire, and about the ſea ſhores of that country. And, 4. A dull, hard, and pale-brown one: this is found in the lead mines of the ſame country, and in ſome parts of Ireland. All theſe ſpecies have the ſame power of double refraction with the firſt, but are too opake to ſhew it ſo beautifully, and often have not tranſparency enough to make it at all diſtinguiſhable.

PARALOGISM, in logic, a falſe reaſoning, or a fault committed in demonſtration, when a conſequence is drawn from principles that are falſe; or, though true, are not proved; or when a propoſition is paſſed over that ſhould have been proved by the way.

A paralogiſm differs from a ſophiſm in this, that the ſophiſm is committed out of deſign and ſubtlety, and the paralogiſm out of miſtake and for want of ſufficient light and application. See the article SOPHISM and DEMONSTRATION.

PARALYSIS, the PALSY. See the article PALSY.

PARALYTIC, a perſon afflicted with the palſy. See the article PALSY.

PARAMECIA, in natural hiſtory, a name given to ſuch animalcules as have no viſible limbs or tails, and are of an irregularly oblong figure. See the article ANIMALCULE.

PARAMESE, in the antient muſic, the note above the meſe, in the greek ſcale; correſponding to a-la-mire, of Guido's ſcale. See the article DIAGRAM.

PARAMETER, in conic ſections, a conſtant line, otherwiſe called latus rectum. See the articles ELLIPSIS, HYPERBOLA, and PARABOLA.

The parameter is ſaid to be conſtant, becauſe in the parabola, the rectangle under it and any abſciſs is always equal to the ſquare of the correſponding ſemi-ordinate; and in the ellipſis and hyperbola, it is a third proportional to the conjugate and tranſverſe axis.

PARAMOUNT, in law ſignifies the ſupreme lord of the fee. See FEE.

The lords of thoſe honours or manors that have other manors under them are ſtiled lords paramount; and the king, by our law is the chief lord of all the lands in England. See MANOR.

PARANA, a province of Paraguay, ſubject to Spain.

PARANETE, in antient muſic, a chord or note of the greek-ſcale. See the article DIAGRAM.

PARANYMPH, *paranymphus*, among the antients, the perſon who waited on the bridegroom, and directed the nuptial ſolemnities; called alſo pronubus, and auſpex, becauſe the ceremonies began by taking auſpicia. As the paranymph officiated only on the part of the bride-groom, a woman called pronuba, officiated on the part of the bride.

PARAPET, in fortification, an elevation of earth deſigned for covering the ſoldiers from the enemies cannon or ſmall ſhot. The thickneſs of the parapet is from eighteen to twenty feet; its height is ſix feet on the inſide, and four or five on the outſide. It is raiſed on the rampart, and has a ſlope above called the ſuperior talus, and ſometimes the glacis of the parapet. The exterior talus of the parapet is the ſlope facing the country: there is a banquette or two for the ſoldiers, who defend the parapet to mount upon, that they may the better diſcover the country, foſſe, and counterſcarpe, and fire as they find occaſion. See GLACIS, TALUS, BANQUET, &c.

Parapet of the covert-way, or corridor, is what covers that way from the fight of the enemy, which renders it the moſt dangerous place for the beſiegers, becauſe of the neighbourhood of the

 faces,

faces, flanks, and curtins of the place.

PARAPET is alſo a little wall raiſed breaſt high on the banks of bridges, keys, or high buildings, to ſerve as a ſtay, and prevent people's falling over.

PARAPHERNALIA, or PARAPHERNA, in the civil law, thoſe goods which a wife brings her huſband beſides her dower, and which are ſtill to remain at her diſpoſal excluſive of her huſband, unleſs there are ſome proviſion made to the contrary in the marriage-contract. Some of our engliſh civilians define the paraphernalia to be ſuch goods as a wife challengeth over and above her dower or jointure, after her huſband's death, as furniture for her chamber, wearing apparel, and jewels, which are not to be put into the inventory of her huſband's goods: and a french civilian calls paraphernalia the moveables, linen, and other female neceſſaries, which are adjudged to a wife in prejudice of the creditors, when ſhe renounces the ſucceſſion of her huſband.

PARAPHIMOSIS, in medicine, a diſorder of the penis, wherein the prepuce is ſhrunk, and withdrawn behind the glans, ſo as not to be capable of being brought to cover the ſame; which generally happens in venereal diſorders. See the article PREPUCE, &c.

In this caſe, it is uſual for the glans to be not only much tumified, inflamed, and painful from the ſtricture, but the free circulation of the blood being thereby obſtructed, will ſhortly bring on a mortification. Thoſe are moſt ſubject to a paraphimoſis who have naturally a ſhort prepuce, and are too intenſe in their embraces with women, who have very ſtrait paſſages, particularly virgins. Boys are ſometimes afflicted with this diſorder, when they laciviouſly draw back their prepuce, being extremely narrow, and afterwards cauſing an erection, it cannot be returned over the glans. But the paraphimoſis oftener ariſes from unclean embraces, for the prepuce being inflamed and tumified by the infectious matter imbibed by it, generally produces this diſorder, when it is alſo naturally ſhort. See the article GONORRHOEA, &c.

The cure of a paraphimoſis, according to Heiſter, conſiſts chiefly in returning the contracted prepuce over the naked glans; but as a violent inflammation is uſually the chief cauſe of its being ſo difficult to return the prepuce in the paraphimoſis, it may be firſt proper to make uſe of diſcutient and emollient fomentations or cataplaſms, with camphorated ſpirit of wine before the prepuce is attempted to be drawn over the glans, which being effected, all the other bad ſymptoms will vaniſh of courſe. However ſome ſurgeons prefer the uſe of cold water, becauſe the former remedies often augment the influx of the blood to the parts, and ſo increaſe the tumour. But when the penis, ſcrotum, and lower part of the abdomen, are immerged in cold water, with plentiful bleeding, the tumor generally ſubſides in a ſhort time: the penis is then to be held between the ſurgeons two foremoſt fingers of each hand, and the glans, having been firſt lubricated with oil or butter, is to be forcibly preſſed back with his thumbs, whilſt the prepuce is at the ſame time drawn forward under his fingers, ſo as to cover the denudated glans; but when the inflammation is not very large, it may be often ſufficient only to bathe the parts in warm water, when there is little or no virulency. On the contrary, when the tumefied penis tends to mortify through the violence of the inflammation, or long continuance of the diſorder, it will be moſt adviſeable to bleed the patient firſt in the arm, and then in the vena dorſalis penis, in which laſt it ſhould be continued till the tumour ſubſides, and then the prepuce may be drawn over the glans as before: and if a gangrene or incipient mortification in the penis, ſhould actually ſucceed a paraphimoſis, it ſhould be treated as before directed, under the articles GANGRENE and MORTIFICATION.

Sometimes the prepuce is ſo much diſtended with the ſerous part of the blood, that it appears like a bliſter raiſed by fire, or a veſicatory: in this caſe it may be proper to make a few punctures with a lancet or ſcalpel to diſcharge the diſtending lymph, and after waſhing the parts in warm wine, the prepuce is to be extended over the glans as before. But to prevent the wounded prepuce from growing to the glans, the patient ſhould frequently draw it backwards and forwards, and wet his glans over with his urine when he makes water, which he ſhould continue till there is no danger of their adhering together: but if, by accident or neglect, there ſhould be ſuch a coheſion of the glans and prepuce, it ought

to

to be immediately separated by the lancet or a proper scalpel, taking great care not to wound the glans. When all the preceeding means prove ineffectual, M. Petit's method of proceeding is to incite the distended or contracted prepuce, by inserting a small and crooked scalpel with the edge outward, and the back towards the glans, and thus he divides the prepuce by incision in three, four, or more places, according as the degree of distention makes it necessary; and after washing the incised parts in warm wine, and reducing the prepuce over the glans covered with a little soft lint, the penis is bound up.

PARAPHRASE, παράφρασις, an explanation of some text, in clearer and more ample terms, whereby is supplied what the author might have said or thought on the subject; such are esteemed Erasmus's paraphrase on the New Testament, the Chaldee paraphrase on the pentateuch, &c.

PARAPHRENITIS, in medicine, an inflammation of the diaphragm. See INFLAMMATION, and DIAPHRAGM.

A paraphrenitis, according to Boerhaave, is attended with a very acute and continual fever; an intolerable inflammatory pain of the part affected, which is extremely augmented by inspiration, coughing, sneezing, repletion of the stomach, a nausea, vomiting, compression of the abdomen in going to stool, or making water. Hence the breathing is thick, short, and suffocating, and performed only by the motion of the thorax. There is also a constant delirium, a drawing in of the hypochondria inwards and upwards, an involuntary laughter, convulsions, and madness.

This disease terminates as in a pleurisy, but is attended with more violent symptoms, and is much more fatal. If the part affected suppurates, the matter will fall into the abdomen, and produce a purulent ascites. See ASCITES.

The cure must be attempted in the same manner as a pleurisy. See the article PLEURISY.

Emollient clysters are often beneficial.

PARAPHROSYNE, a word used by medical writers to express a delirium, or an alienation of mind in fevers, or from whatever cause.

PARAPLEGIA, or PARAPLEXIA, in medicine, a species of paralysis, or palsy, usually succeeding an apoplexy. See the article PALSY.

Boerhaave defines it an immobility of all the muscles below the head, that have nerves from the cerebrum and cerebellum; sometimes all sense, as well as motion, are destroyed thereby, and sometimes only one of them is lost; hence the paraplegia is a general palsy affecting the whole body, the head alone excepted.

PARAPLEXIA, the same with paraplegia. See the preceding article.

PARAPOTAMIA, in the materia medica of the antients, a word used at first as an epithet of distinction for a kind of œnanthe, from which the œnanthine ointment of the Greeks was made, but afterwards used simply as the name of that plant.

PARASANG, an antient persian measure, different at different times, and in different places; being sometimes thirty, sometimes forty, and sometimes fifty stadia, or furlongs.

PARASCEVE, the sixth day of the last week of Lent, commonly called Good Friday.

PARASELENE, in physiology, a mock moon, a meteor, or phænomenon, encompassing, or adjacent to, the moon, in form of a luminous ring; wherein are sometimes observed one, sometimes two, apparent images of the moon.

The paraselenes are formed after the same manner as the parhelia, or mock suns. See the article PARHELIUM.

PARASITE, παράσιτος, among the Greeks, was originally a very reputable title; the parasites being a kind of priests, at least ministers, of the gods, in the same manner as the Epulones were at Rome. They took care of the sacred corn, or the corn destined for the service of the temples, and the gods, *viz.* sacrifices, feasts, &c. they had even the intendance over sacrifices and took care that they were duly performed. At Athens, there was a kind of college of twelve parasites; each people of Attica furnishing one, who was always chosen out of the best families. Polybius adds, that a parasite was also an honourable title among the antient Gauls, and was given to their poets; but of late it has been made a term of reproach, and used for a flatterer, and mean dependant.

PARASITES, or PARASITICAL PLANTS, in botany, such plants as are produced out of the trunk or branches of other plants, from whence they receive their nourishment,

nourishment, and will not grow upon the ground, as the misleto, &c.

PARASOL, a little moveable, in manner of a canopy, borne in the hand, to screen the head from the sun, rain, &c. more usually called umbrella. It is made of leather, taffety, oil-cloth, &c. mounted on a stick, and opened or shut at pleasure, by means of pieces of whalebone that sustain it.

PARASTATA, in the antient architecture, an impost, or kind of anta, or pilaster, built for the support of an arch; or as some will have it, pilasters, which stand alone, not adjoining to the wall. Daviler makes a parastata the same with impost, but Evelyn the same with pilaster.

PARASTATÆ, or EPIDIDYMIDES, in anatomy, two tuberous varicose bodies, lying upon, and adhering to, the upper part of the testicles, whereof they properly appear to be a part, though different from the rest in form and consistence.

The parastatæ are oblong, nearly of a cylindric figure, resembling in some measure the body of a caterpillar, or silkworm. They are connected with the testicle by means of the tunica albuginea, and also with the vas deferens. Their origin is in the testicles, by five or six very small seminal vessels, and their termination is in the other extremity of the testicle, where the vas deferens begins. They are surrounded by a robust membrane, which is continuous with the albuginea of the testicle; they are composed of vessels in the same manner as the testicles, which are capable of being elegantly filled with injections. All these vessels terminate in one duct at last, and this duct is called the vas deferens: the vessels they are composed of are much more conspicuous than those which form the testicles: their blood-vessels being the same with those of the testicles, are called spermatics; their nerves proceed from the same branches with those of the testicles; their use is to receive the semen from the testicles, to farther elaborate and perfect it, and finally to convey it into the vas deferens. See the article DEFERENTIA VASA, &c.

PARASYNANCHE, in medicine, a kind of angina, or quinzy, wherein the exterior muscles of the throat are inflamed. See the article QUINZY.

PARATHENAR, in anatomy, the name of two muscles of the foot; one of which, the parathenar major, is a pretty long muscle, forming a part of the outer edge of the sole of the foot. It is fixed backward by a fleshy body to the outer part of the lower side of the os calcis, from the small posterior external tuberosity all the way to the anterior tuberosity: there it joins the metatarsus, and at the basis of the fifth metatarsal bone separates from it again, and forms a tendon which is inserted in the outside of the first phalanx of the little toe, near its basis, and near the insertion of the other parathenar: this last is called the parathenar minor; being a fleshy muscle fixed along the posterior half of the fifth bone of the metatarsus, and terminating under the head of that bone in a tendon which is inserted in the lower part of the basis of the first phalanx of the little toe.

PARATHESIS, in grammar, the same with apposition. See APPOSITION.

PARATHESIS, is also the same with parenthesis. See PARENTHESIS.

PARATHESIS, in the greek church, the prayer which the bishop rehearses over the catechumens, stretching his hand over them to give them benediction, which they receive bowing their heads under his hands.

PARATITLES, *paratitla*, in jurisprudence, short notes or summaries of the titles of the digest and code; which have been made by several lawyers, in order to compare and examine the connection of the several parts with one another. See DIGEST and CODE.

PARAVAIL, or PARAVAILE, signifies a person that is tenant to one who holds of another, or the lowest tenant of the fee.

PARAZONIUM, or SCIPIO, among medalists, a sceptre, rounded at the two ends in manner of a truncheon, or commander's staff; or a kind of poniard or short sword, represented as worn at the girdle on several antient medals.

Antiquaries are much divided on the explication of the parazonium, on account that the form and manner of bearing it are very different. It is sometimes thrown across the shoulders in manner of a quiver.

PARBOILING, in pharmacy, &c. a term applied to fruits, herbs, &c. which are boiled a little while, to draw out the first juices, in order to be afterwards inspissated or thickened. See BOILING.

PARBUNCLE, in a ship, the name of a rope almost like a pair of slings: it is seized both ends together, and then put

double

double about any heavy thing that is to be hoisted in or out of the ship; having the hook of the runner hitched into it, to hoise it up by.

PARCÆ, in the heathen mythology, goddesses, who were supposed to preside over the accidents and events, and to determine the date or period, of human life.

The antients reckoned the parcæ, who were also called fates and destinies, to be three in number, because all things have their beginning, progress and end. They were called Atropos, Clotho, and Lachesis, and are represented as spinning the thread of human life, in which employment Clotho held the distaff. Lachesis turned the wheel, and Atropos cut the thread. Their persons are variously described; sometimes they are represented as old women, one holding a distaff, another a wheel, and a third a pair of sciffars. Others paint Clotho in a robe of divers colours, with a crown of stars upon her head, and holding a distaff in her hand; Lachesis in a garment covered with stars, and holding several spindles; and Atropos they clad in black, cutting the thread with a large pair of sciffars.

PARCEL-MAKERS, two officers in the exchequer, who make parcels of the escheator's accounts, in which they charge them with every thing they have levied for the king's use, within the time of their office, and deliver the same to one of the auditors of the court, to make their accounts therewith.

PARCHMENT, in commerce, the skins of sheep or goats prepared after such a manner as to render it proper for writing upon, covering books, &c.

The manufacture of parchment is begun by the skinner, and finished by the parchment-maker.

The skin having been stripped of its wool, and placed in the lime-pit, in the manner described under the article SHAMMY, the skinner stretches it on a kind of frame, and pares off the flesh with an iron instrument; this done, it is moistened with a rag, and powdered chalk being spread over it, the skinner takes a large pumice-stone, flat at bottom, and rubs over the skin, and thus scowers off the flesh; he then goes over it again with the iron instrument, moistens it as before, and rubs it again with the pumice-stone without any chalk underneath: this smooths and softens the flesh side very considerably. He then drains it again, by passing over it the iron instrument as before. The flesh side being thus drained, by scraping off the moisture, he in the same manner passes the iron over the wool or hair-side: then stretches it tight on a frame, and scrapes the flesh-side again: this finishes its draining; and the more it is drained, the whiter it becomes. The skinner now throws on more chalk, sweeping it over with a piece of lamb-skin that has the wool on, and this smooths it still farther. It is now left to dry, and when dried, taken off the frame by cutting it all round. The skin thus far prepared by the skinner, is taken out of his hands by the parchment-maker, who first, while it is dry, pares it on a summer, (which is a calf skin stretched in a frame) with a sharper instrument than that used by the skinner, and working with the arm from the top to the bottom of the skin, takes away about one half of its thickness. The skin thus equally pared on the flesh side, is again rendered smooth, by being rubbed with the pumice stone, on a bench covered with a sack stuffed with flocks, which leaves the parchment in a condition fit for writing upon. The parings thus taken off the leather, are used in making glue, size, &c. See the article GLUE, &c.

What is called vellum, is only parchment made of the skins of abortives, or at least sucking calves. This has a much finer grain, and is whiter and smoother than parchment; but is prepared in the same manner, except its not being passed through the lime-pit.

Parchment on being imported, pays a duty of 1 l. 5 s. $\frac{64\frac{1}{2}}{100}$ d. for every roll, containing six dozen, of which 9 s. $\frac{67\frac{1}{2}}{100}$ d. is drawn back on exportation.

PARCO FRACTO, in law, is a writ which lies against a person that breaks any pound, and takes out from thence beasts lawfully impounded. On this writ damages are recoverable, and the party offending may be punished, as for a pound-breach in the court-leet.

PARDALUS, or PARDUS, the leopard. See the article LEOPARD.

PARDO, a fine palace belonging to the king of Spain, with a fine park and gardens, about six miles north-west of Madrid.

PARDON, in law, is the forgiveness of an

an offence againſt the king or the laws. A pardon may be granted either before attainder or conviction, or afterwards, and they are alſo ſometimes granted upon conditions, on the performance of which the validity of the pardon depends. Pardons are general, and either by act of parliament, or by the king's charter granted upon ſome public occaſion, as a coronation, &c. or particular, when granted by the king to particular perſons. As to a general pardon, it not only diſcharges the puniſhment to which the offender was liable, but alſo the guilt of the crime itſelf; and ſome lawyers maintain, that it pardons the crime ſo fully, that the offender in the eye of the law is deemed as innocent as if he had never committed it. For this reaſon, after the pardon, a perſon, on being called felon or traitor, may have an action for ſcandal; and he may be a good witneſs, notwithſtanding his conviction or attainder, becauſe the pardon makes ſuch a perſon a new man, and gives him freſh credit. But though a general pardon extends to public offences againſt the commonwealth, it does not extend to private injuries committed againſt particular perſons, and therefore, he that would reap the benefit of ſuch a pardon muſt plead the ſtatute, &c. by which it was granted, in order that the court may judge whether his offence be included within the ſtatute or not; likewiſe where there is an exception in the pardon, he muſt ſhew that he is not the perſon excepted againſt. Neither can the king's charter of pardon be allowed, unleſs it be pleaded and produced in court; where the party at the bar muſt, upon his knees, pray the allowance of it. No pardon of felony, &c. can paſs without warrant of the privy ſeal, and thoſe who have been guilty of felony, notwithſtanding their pardon, are to enter into a recognizance with two ſufficient ſureties for their good behaviour for ſeven years. In what caſes, on the diſcovery of accomplices, pardons are allowed by ſtatute may be ſeen in 4 and 5 William and Mary, and 11 William III.

PAREGORICS, in pharmacy, medicines that aſſuage pain, otherwiſe called anodynes. See the article ANODYNE.

PAREIRA BRAVA, in the materia medica, a kind of oblong, and large root, brought from the Braſils; but the plant, to which it belongs, is not known. It is certainly a diuretic of no mean character, and has done great ſervice in nephritic caſes, and in pleuriſies and quinſies it has been attended with more ſucceſs than almoſt any medicine we know of ſingly. In ſuppreſſions of urine, ſcarce any thing is more efficacious or more inſtantaneous in its effects; but it is a folly to infer from this, that it will diſſolve the ſtone. This medicine diſſolves the mucous humour that ſtops up the paſſages of the kidnies, &c. and expels all the ſtony matter not yet formed into large and hard maſſes. And in caſes of ulceration of the kidnies and bladder, after the uſe of this remedy, the urine flows copiouſly and becomes more limpid, and the ulcerations are ſoon healed upon giving a little balſam capivi mixed with it.

Geoffroy, who highly commends the pareira brava, adds that in humoral aſthmas ariſing from a glutinous phlegm obſtructing the bronchia, after all other methods tried in vain, this root has promoted an expectoration; and the ſame ſucceſs he has had with it in a jaundice ariſing from a thick and grumous ſtate of the bile; he alſo recommends it greatly in gonorrhœas, mixed with balſam capivi, given in powder and made into a bolus; or, with that and calomel, with ſome thick ſyrup. Two drachms of it will ſerve for a decoction to be taken at about three doſes.

Beſides the true pareira brava, there is another called the pareira brava alba; it is ſaid, by the Portugueſe, to poſſeſs the ſame virtues with the former, but in a more remiſs degree.

PARELCON, in grammar, a figure by which a word or ſyllable is added to the end of another.

PARELIUM, or PARHELIUM. See the article PARHELIUM.

PAREMBOLE, Παρεμβολη, in rhetoric, a figure wherein ſomething relating to the ſubject is inſerted in the middle of a period. All the differences between the parembole and parentheſis, according to Voſſius, is, that the former relates to the ſubject in hand, whereas the latter is foreign to it. An example of each we have in Virgil; and firſt of the parembole.

Æneas (neque enim patrius conſiſtere mentem
Paſſus amor) rapidum ad naves præmittit Achatem.

The

The following is an inftance of the parenthefis:

————ipfique fuos jam morte fub ægrâ
(Di meliora piis, erroremque hoftibus illum)
Difciffos nudis laniabant dentibus artus.

See the article PARENTHESIS.

PARENCHYMA, in anatomy, a term introduced by Erafiftratus, fignifying all that fubftance which is contained in the interftices betwixt the blood-veffels of the vifcera, which he imagined to be extravafated and concreted blood. The moderns having difcovered all the vifcera to be vafculary and glandulous, have rejected this term, together with the doctrine.

PARENCHYMA *of plants.* Grew applies the term parenchyma to the pith or pulp, or that inner part of a fruit or plant through which the juice is fuppofed to be diftributed. This, when viewed with a microfcope, appears to refemble marrow, or rather a fponge, being a porous, flexible, dilatable fubftance. Its pores are innumerable and exceedingly fmall, receiving as much humour as is requifite to fill and extend them, which difpofition of pores it is that is fuppofed to fit the plant for vegetation and growth.

PARENT, *parens,* a term of relation applicable to thofe from whom we immediately receive our being. See the articles FATHER and MOTHER.

Parents, by the law of nature, are bound to educate, maintain, and defend their children, over whom they have power by that law: they likewife have intereft in the profits of their children's labour, during their nonage, in cafe the children live with and are provided for by them: yet the parent has no intereft in the real or perfonal eftate of a child, any otherwife than as his guardian.

PARENTALIA, in antiquity, funeral obfequies, or the laft duties paid by children to their deceafed parents.

It is alfo ufed for a facrifice, or folemn fervice, offered annually to the manes of the dead.

PARENTELA. De parentela fe tollere, was antiently ufed among us to denote a perfon's renouncing his kindred or family.

This was performed in open court before the judge, in the prefence of twelve men, who made oath that they believed it was done on good grounds.

PARENTHESIS, in grammar, certain intercalary words, inferted in a difcourfe, which interrupt the fenfe, or thread, but feem neceffary for the better underftanding of the fubject.

The proper characteriftic of a parenthefis is, that it may be either taken in or left out, the fenfe and the grammar remaining intire. In fpeaking, the parenthefis is to be pronounced in a different tone; and in writing, it is enclofed between ( ), called alfo a parenthefis, but commonly a bracket, or crochet, to diftinguifh it from the reft of the difcourfe. The politeft of our modern writers avoid all parenthefes, as keeping the mind in fufpenfe, embaraffing it, and rendering the difcourfe lefs clear, uniform, and agreeable.

The parenthefis is frequently confounded with the parembole. See the article PAREMBOLE.

PARENZO, or PIRENZO, a port-town of Iftria, in the territory of Venice, fituated on a bay of the gulph of Venice, twenty-five miles fouth of Cabo de Iftria.

PARERGA, παρεργα, a term fometimes ufed in architecture for additions or appendages made, by way of ornament, to a principal work.

It is fometimes ufed in painting for little pieces or compartiments, on the fides or in the corners of the principal piece.

PARESIS, παρεσις, in medicine, is defined to be a palfy of the bladder, wherein the urine is either fuppreffed or difcharged involuntarily. See PALSY.

PARETONIUM, in natural hiftory, the name of an earth antiently found on the fhores of Egypt, Cyrene, and the ifland of Crete, and ufed by the antients in painting. There has been fome difference among the earlier writers about the nature and origin of this fubftance, and of late we have been taught to think it loft; but it is ftill common on the fhores of moft of the iflands of the Archipelago, though not obferved or regarded; and is truly a very heavy and tough clay, of a fine white colour, found in maffes of different fizes, generally as foft as the fofter clays within the ftrata; and by rolling about on the beech in this ftate, it gathers up the fand, fmall fhells, and other foulneffes we always find about it. It is moft probable, that there are ftrata of it fine and pure in the cliffs there, and that the fea wafhes off maffes of them in ftorms and high tides, which are what we find.

PARGET, in natural hiftory, a name given

given to feveral kinds of gypfum, or plafter ftone. See PLASTER.

PARGETING, in building, is ufed for the plaftering of walls, and fometimes for the plafter itfelf.

Pargeting is of various kinds, as, 1. white-lime, hair, and mortar, laid upon bare walls: 2. on bare laths, as in partitioning and ceiling: 3. rendering the infides of walls, or doubling partition-walls: 4. rough-cafting upon heart-laths: 5. plaftering on brick-work, with a finifhing mortar, in imitation of ftone work.

PARHELIUM, or PARHELION, in phyfiology, a mock fun, or meteor, in form of a very bright light, appearing on one fide of the fun.

The parhelia are formed by the reflection of the fun's beams on a cloud properly pofited. They ufually accompany the coronæ, or luminous circles, and are placed in the fame circumference and at the fame height. Their colours refemble that of the rainbow, the red and yellow are on the fide towards the fun, and the blue and violet on the other. There are coronæ fometimes feen without parhelia, and *vice verfa*.

Parhelia are double, triple, &c. and in 1629, a parhelion of five funs was feen at Rome; and in 1666, another at Arles of fix.

M. Mariotte accounts for parhelia from an infinity of little particles of ice floating in the air, that multiply the image of the fun by refraction or reflection; and by a geometrical calculus he has determined the precife figure of thefe little icicles, their fituation in the air, and the fize of the coronæ of circles which accompany the parhelia, and the colours wherewith they are painted. M. Huygens accounts for the formation of a parhelion in the fame manner as for that of the halo. See the article HALO.

PARIA, a lake of Peru, in fouth America, in the province of Los Charcas, fituated in 67° weft long. and 22° fouth lat.

PARIA, or NEW-ANDALUSIA, a country of Terra-Firma, in fouth-America, having the Atlantic-Ocean on the north; the country of Guiana, from which it is feparated by the river Oronoque, on the eaft; and Venezuela on the weft.

PARIAN MARBLE. See MARBLE.

PARIETALIA OSSA, in anatomy, the fecond and third bones of the cranium; being called alfo offa-bregmatis, and offa-fincipitis.

Thefe bones are of a larger extent than any of the other bones of the fkull: their figure is nearly that of an irregular convex fquare; they have each an external convex fide, and an internal and concave one; four edges, one fuperior or fagittal, one inferior or temporal, one anterior or frontal, and one pofterior or occipital. In the external furface of the parietals, is the place of part of the temporal mufcle or crotophytes. In their internal furface are furrows reprefenting little fhrubs; thefe are formed by the arteries of the dura mater: befides thefe there are other foveæ.

PARIETES, in anatomy, a term ufed for the inclofures, or membranes, that ftop up or clofe the hollow parts of the body, efpecially thofe of the heart, thorax, &c.

PARIETARIA, PELLITORY OF THE WALL, in botany, a genus of the polygamia-monoecia clafs of plants, having no corolla: the ftamina are four fubulated filaments; the antheræ are didymous; there is no pericarpium; the perianthium is elongated, very large, and campanulated; the feed is fingle and roundifh. This plant is very famous in the materia medica, as cooling and abftergent. It is prefcribed in ftranguries, and in cafes of gravel, or fmall ftones in the kidneys, and is an ingredient in decoctions for clyfters to be given in nephritic cafes. Externally, it is much recommended in the eryfipelas, and for the foftening of hard tumours.

PARIS, HERB TRUE-LOVE, in botany, a genus of the octandria-trigynia clafs of plants, the corolla whereof confifts of four oblong, plane, patent petals; the fruit is a berry of a globofe, tetragonal form, containing four cells, and ftanding in the cup: the feeds are numerous, and arranged in a double feries.

PARIS, in geography, the metropolis of the kingdom of France, and of the principality or government of the ifle of France, fituated in eaft long. 2° 25', north lat. 48° 50', two hundred miles fouth-eaft of London, fix hundred and eighty north-eaft of Madrid, five hundred and fifty weft of Vienna, one thoufand three hundred north-weft of Conftantinople, and feven hundred north-weft of Rome.

Paris is ufually divided into three parts: 1. the town, which is the largeft, fituated on

on the north side of the river Seyne: 2. the city, much the least, but the most antient, consisting of three little islands in the middle of the Seyne: 3. the university, which lies on the south side of the river. The whole town is of a circular form, six leagues in circumference, and the diameter three, and containing seven hundred thousand inhabitants.

PARISH, the precinct of a parochial church, or a circuit of ground inhabited by people who belong to one church, and are under the particular charge of its minister.

A parish may contain several villages within its limits, though in general it is accounted to contain no more than one, except the contrary be made to appear: and an antient village, which time out of mind has had a church of its own, and chosen overseers, *&c.* may be a parish in reputation, so as to provide for its own poor only, and be excused from contributing to the poor of the parish in which it lies, 43 Eliz. c. 2.

In England there are nine thousand, nine hundred and thirteen parishes, of which three thousand, eight hundred and forty-five are churches impropriate, and the rest are annexed to colleges, or church dignities. In many of these parishes, on account of their large extent, and the number of parishioners, there are several chapels of ease.

PARISH-OFFICERS, officers chosen annually to regulate and manage the concerns of the parish, for which see the articles CHURCH-WARDENS and OVERSEERS *of the poor.*

PARISIS, an epithet formerly given to the money struck at Paris, to distinguish it from the coin called tournois, which was at the same time struck at Tours. The parisis exceeded the tournois by one fourth, so that the sol parisis was worth fifteen deniers, and the sol-tournois but twelve.

PARK, a large inclosure privileged for wild beasts of chace, either by prescription or the king's grant. No person can now erect a park without his obtaining first a licence under the broad-seal; but there may be such in reputation, though erected without lawful warrant, and the owner may bring his action against persons that kill his deer therein. The pulling down walls, or pales, makes the offenders liable to the same penalty as for killing of deer.

PARK, is also used for a moveable inclosure, or fold, set up in the fields for sheep to feed and rest in during the night. This park is frequently removed by the shepherds to dung the ground one part after another.

PARK, also signifies a large net, placed on the brink of the sea, with only one entrance, which is next the shore, and which is left dry by the ebb of the tide; so that the fish once got in have no way left to escape.

PARK *of artillery.* See the article ARTILLERY PARK.

PARK-ABBY, a place near Louvain, in the Netherlands, which being an excellent situation for a camp, was frequently possessed by the armies in the late war.

PARKINSONIA, in botany, a genus of the decandria monogynia class of plants, the corolla of which consists of five petals, nearly equal in size: the fruit is an oblong legume, nodose at the seeds, and acuminated: the seeds are numerous.

PARLEY, a conference with an enemy. Hence to beat or sound a parley, is to give a signal for holding such a conference by beat of drum or sound of trumpet.

PARLIAMENT, is the grand assembly of the three states of this kingdom, summoned together, by the king's authority, to consult of matters relating to the public welfare, and particularly to enact and repeal laws. It consists of the king, the lords spiritual and temporal, and the commons, and is at once the seat of the legislative authority, and the highest court of justice in Great-Britain. In the house of lords, criminal causes are tried on the impeachment of the commons; and this house has an original jurisdiction for the trial of peers upon indictments found by a grand jury; the lords likewise try such causes as come thither on appeals from the court of chancery, and all their decrees are as judgments. The house of commons examine the right of elections, regulate disputes concerning them, may expel their own members, and commit them to prison; they are the grand inquest of the nation, and present public grievances or delinquents to the king and lords, in order to their being punished. In short, they are the representatives of all the commons in the kingdom, and in them their constituents have placed the highest confidence, by investing them with the power of making laws, and entrusting them with all their liberties and privileges. Originally, new parliaments were called

every year; but by degrees their term grew longer. In the reign of king Charles II. they were held a long time, with great interruptions between: but both methods were found of ſuch ill conſequence, that, in the beginning of the reign of king William III. an act was paſſed, by which the term of all parliaments was reſtrained to three ſeſſions, or three years; this was hence called the triennial act: but ſince that time, from other views, the period of parliaments has been lengthened to ſeven years. A parliament is called by the king's writ or letter directed to each lord, commanding him to appear; and by other writs, directed to the ſheriffs of each county, to ſummon the people to elect two knights for each county, and one or two burgeſſes for each borough. The number of the members in the houſe of lords is uncertain, as encreaſing at the king's pleaſure. The members of the houſe of commons, when full, are five hundred and fifty-three; *viz.* ninety-two knights of the ſhires; fifty-two deputies for twenty-five cities, London having four; ſixteen for the eight cinque-ports; two for each univerſity; three hundred and thirty-two for an hundred and eighty boroughs; twelve for the boroughs in Wales, and forty-five members for Scotland. If three hundred of theſe members are met, it is reckoned a full houſe; and forty may compoſe a houſe for the diſpatch of buſineſs.

Upon the holding of a parliament, the king, the firſt day, ſits in the upper-houſe, under a canopy, with the crown on his head, and dreſſed in his royal robes; and there, by himſelf, or the lord chancellor, declares the reaſons of their meeting, in the preſence of both the lords and commons, and then the commons are required to chooſe a ſpeaker, who is preſented to the king, and being approved by his majeſty, the buſineſs of the parliament goes on.

The lords and commons ſit each in a diſtinct apartment: in the houſe of lords, the princes of the blood ſit by themſelves on the ſides of the throne; at the wall, on the king's right hand, the two archbiſhops ſit by themſelves on a form. Below them, the biſhops of London, Durham and Wincheſter, and all the other biſhops ſit according to the priority of their conſecretion. On the king's left hand, the lord-treaſurer, lord preſident, and lord-privy-ſeal ſit upon forms above all dukes, except the royal blood; then the dukes, marquiſſes, and earls, according to their creation. A-croſs the room are wool-ſacks, continued from an antient cuſtom; and the chancellor, or keeper, being of courſe the ſpeaker of the houſe of lords, ſits on the firſt wool-ſack before the throne, with the great ſeal or mace lying by him; below theſe are forms for the viſcounts and barons. On the other wool-ſacks are ſeated the judges, maſters in chancery, and king's council, who are only to give their advice in points of law: but they all ſtand up till the king gives them leave to ſit. The commons ſit promiſcuouſly, only the ſpeaker has a chair at the upper end of the houſe, and the clerk and his aſſiſtant ſit at a table near him. Before any buſineſs is done, all the members of the houſe of commons take the oaths of allegiance and ſupremacy, *&c.* and ſubſcribe their opinions againſt tranſubſtantiation, *&c.* and if any member of that houſe votes, or ſits there during any debate, after the ſpeaker is choſen, without having firſt taken theſe oaths, between the hours of nine and four, in a full houſe, he is adjudged a popiſh recuſant convict, and incapable of any office, and forfeits five hundred pounds. The ſame teſt the lords too, though they do not take the oaths, are obliged to comply with. When the parliament is thus met, no members are to depart from it without leave. Upon extraordinary occaſions, all the members are ſometimes ſummoned, in which caſe every lord ſpiritual and temporal, and every knight, citizen, and burgeſs is to come to parliament, except he can reaſonably and honeſtly excuſe himſelf; or be amerced: that is, reſpectively, a lord by the lords, and a commoner by the commons.

All members of parliament, in order that they may attend the public ſervice of their country, have the privilege for themſelves and their menial ſervants, of being free from arreſts, attachments, impriſonments, *&c.* for debts, treſpaſſes, *&c.* but not from arreſts for treaſon, felony, and breach of the peace: however, it is ordained by ſtatute, that actions may be commenced, in any of the courts of Weſtminſter, againſt perſons intitled to privilege of parliament, after a prorogation or diſſolution, till a new parliament is called, or the ſame become re-aſſembled; and likewiſe after an adjournment for above fourteen days; and the reſpective courts, in ſuch a caſe, have power to proceed

proceed to judgment, &c. here the process is to be summons, distress infinite, &c. till the parties shall enter an appearance; and for default thereof, the real or personal estate of the defendant may be sequestered; though the plaintiff may not, in that case, arrest the body of any member of parliament: 12 W. III. c. 3.

As to the election of members, it is enacted that candidates shall not make any presents of money to, or treat the electors, after the teste of the writ of the summons, or the issuing out of the writs for elections, or after any seat for a member of parliament is become vacant; in case they do, they are declared incapable of serving as members, by 7 W. III. c. 4. And farther, an oath is to be taken by electors, that they have not either received, or had any money, gift, reward, or any office, place, employment, or even promise of money, gift, &c. to them or their use, to give their votes; and in these cases, if they ask, take, or contract for money or reward, either by gift or other device, to give or refuse their votes for any one; or if persons, by gift, &c. corruptly procure any elector to give his vote, they shall forfeit five hundred pounds, and be totally disabled to vote at any election of members of parliament, as also to hold any office, franchise, &c. Likewise officers who admit persons to vote without their taking the aforementioned oath, in case the same be demanded, incur a forfeiture of one hundred pounds; and an oath is to be administred to all the returning officers, that they have not received any money, gift, or place, for the making of their returns: 2 Geo. II. c. 24. 9 Geo. II. c. 38. A knight of the shire must be worth six hundred pounds a year in land, and all other members three hundred pounds.

Antiently all the people had votes in elections, till it was enacted by Henry VI. that none but freeholders, who had a yearly revenue of forty shillings, should be admitted to vote for knights of the shire.

The manner of debating upon, and passing bills in parliament, is as follows: any member may move to have a bill brought in, which, upon a question put, being agreed to by the majority, this person, with others, is ordered to prepare and bring in the same. When it is ready, a time is appointed for its being read, and after the clerk's reading it, the speaker reads an abstract of it, and puts the question whether or no it shall have a second reading? and after a second reading, the question is put, whether or no it shall be committed? which is either to a committee of the whole house, if it be of importance, or to a private committee, any member naming the persons. The committee being appointed, and a chairman chosen, the chairman reads the bill paragraph by paragraph, puts every clause to the question, fills up the blanks and makes amendments, according to the opinion of the majority. The bill thus gone through, the chairman makes his report at the side-bar of the house, reads all the additions and amendments, &c. and moves for leave to bring up the report to the table; which granted, he delivers it to the clerk, who reads the amendments, &c. The speaker then puts the question whether they shall be read a second time; and, if agreed to, he reads them himself. To so many of the amendments as the house acquiesces in, the question is now put, whether the bill, thus amended, shall be ingrossed and written fair upon parchment, and read a third time? and the bill being ingrossed, the speaker holds it in his hand, and asks if it shall pass? If the majority be for it, the clerk writes on it, *Soit baillé aux seigneurs*, let it be delivered to the lords: or, if in the house of lords, *Soit baillé aux communes*, let it be delivered to the commons. If a bill be rejected, it cannot be any more proposed during that session. A bill for a general pardon has but one reading.

When a member of the house of commons speaks, he stands up uncovered, and directs his speech to the speaker only. If what he says be answered by another, he is not allowed to reply the same day, unless personal reflections have been cast upon him: but when the commons, in order to have a greater freedom of debate, have resolved themselves into a committee of the whole house, every member may speak to a question as often as he thinks necessary. In the house of lords they vote, beginning at the puisne, or lowest baron, and so up orderly to the highest, every one answering *content* or *not content*. In the house of commons they vote by *yeas* and *nays*; and if it be dubious which are the greater number, the house divides. If the question be about bringing any thing into the house, the *yeas* go out; but if it be about any thing

thing the houfe already has, the *nays* go out. In all divifions the fpeaker appoints four tellers, two of each opinion. In a committee of the whole houfe, they divide by changing fides, the *yeas* taking the right and the *nays* the left of the chair; and then there are but two tellers. If a bill pafs one houfe, and the other demur to it, a conference is demanded in the painted chamber, where certain members are deputed from each houfe; and here the lords fit covered, and the commons ftand bare and debate the cafe. If they difagree, the affair is null; but if they agree, this, with the other bills that have paffed both houfes, is brought down to the king in the houfe of lords, who comes thither clothed in his royal robes; before him the clerk of the parliament reads the title of each bill, and as he reads, the clerk of the crown pronounces the royal affent or diffent. If it be a public bill, the royal affent is given in thefe words, *Le roy le veut*, the king will have it fo; if private, *Soit fait comme il eft defiré*, let the requeft be complied with: if the king refufes the bill, the anfwer is, *Le roy s'avifera*, the king will think of it: and if it be a money-bill, the anfwer is, *Le roy remercie fes loyaux fujets, accepte leur benevolence, & auffi le veut*; the king thanks his loyal fubjects, accepts their benevolence, and therefore grants his confent.

Parliaments *of France*, are fovereign courts, eftablifhed by the king, finally to determine all difputes between particular perfons, and to pronounce on appeals from fentences given by inferior judges. There are ten of thefe parliaments in France, of which that of Paris is the chief, its privileges and jurifdiction being of the greateft extent. It confifts of fix chambers, *viz.* the grand chamber, where caufes of audience are pleaded; and five chambers of inqueft, where proceffes are adjudged in writing. This parliament enjoys the privilege of verifying and regiftering the king's arrets or edicts, without which thofe edicts are of little or no value.

Parliament *of Sweden*, confifts of four eftates, with the king at their head: thefe ftates are, 1. the nobility and reprefentatives of the gentry, with whom the colonels, lieutenant-colonels, majors, and captains of every regiment fit and vote. 2. The clergy, one of which body is elected from every rural deanery of ten parifhes; who, with the bifhops and fuperintendents, amount to about two hundred. 3. The burghers, elected by the magiftrates and council of every corporation as their reprefentatives, of whom there are four for Stockholm, and two for every other town, amounting in the whole to about an hundred and fifty. 4. The peafants, chofen by the peafants out of every diftrict; who choofe one of their own rank, and not a gentleman, to reprefent them: thefe amount to about two hundred and fifty.

All thefe generally meet at Stockholm, and after the ftate-affairs have been reprefented to them from the throne, they feparate, and fit in four feveral chambers or houfes, in each of which affairs are carried on by a majority of votes; and every chamber has a negative in the paffing any law.

Parliament is alfo fometimes ufed for other affemblies befides the ftates of a kingdom: thus the affembly of fome of our inns of court, called to confult on their common affairs, is at this day called a parliament.

PARLOUR, a fair lower room, defigned principally for the entertainment of company. See the article Apartment.

In nunneries, parlour, or parlair, is a little room or clofet, where people talk to the nuns through a kind of grated window. Antiently there were parlours in the convents of monks, where the novices ufe to converfe together at the hours of recreation; but there were liftening places over, from whence the fuperiors could hear every thing that was faid.

PARMA, the capital of the dutchy of Parma, in Italy, fixty miles north-eaft of Genoa, is pleafantly fituated on a river to which it gives name: eaft long. 11°, north lat. 44° 45′.

Parma, among antiquarians, denotes a kind of buckler, of a round figure, big enough to cover the whole body.

PARNASSIA, in botany, a genus of the pentandria-tetragynia clafs of plants, the corolla whereof confifts of five roundifh, emarginated, ftriated, concave, patent petals; the fruit is a tetragono-oval capfule, formed of four valves, containing one cell, and having a quadruple receptacle affixed to the valves: the feeds are numerous and oblong.

PARNASSUS, a mountain of Greece, much celebrated by antient poets, fituated near Caftro in Livadia.

PARNAU,

PARNAU, or PERNOW, a city and port-town of Livonia, eighty miles north of Riga.

PAROCHIAL, ſomething belonging to a pariſh. See PARISH, CHURCH, *&c.*

PARODICAL *degrees of an equation,* in algebra, are the ſeveral regular terms in quadratic, cubic, biquadratic equations, *&c.* the indexes of whoſe powers aſcend or deſcend orderly in an arithmetical progreſs, as $z^3 + z^2 m + zr = s$, is a cubical equation, where no term is wanting, but having all its parodic degrees, the indexes of the terms regularly deſcending thus 3, 2, 1, 0.

PARODY, παρωδια, a popular maxim, adage, or proverb.

Parody is alſo a poetical pleaſantry, conſiſting in applying the verſes written on one ſubject, by way of ridicule to another; or in turning a ſerious work into a burleſque, by affecting to obſerve, as nearly as poſſible, the ſame rhymes, words, and cadences. It comes near to what ſome of our late writers call traveſty; and was firſt ſet on foot by the Greeks, from whom we borrow the name.

PAROL, or PAROLE, in law, is uſed for a plea in court: ſometimes this word is joined with the term leaſe; thus leaſe-parole denotes a leaſe by word of mouth, in order to diſtinguiſh it from a leaſe in writing.

PAROL-ARREST ſignifies an arreſt by word of mouth, where authoriſed to be made; as in the caſe of a breach of the peace, committed in a juſtice of the peace's preſence, he may thereon verbally order the offender to be arreſted.

PAROL-DEMURRER is ſaid to be a privilege allowed to an infant that is ſued in relation to lands, which came to him by deſcent, when the court will give judgment, that the ſuit ſhall remain or continue, until the infant arrives at full age, *viz.* twenty-one years. In this caſe, if on a parol-demurrer, the age is granted, the writ does not abate, but the plea is put without day, till the infant is of age, and then it is revived by a reſummons, *&c.* The plaintiff in an action cannot pray parol-demurrer, during the nonage of the infant-defendant, for it is grantable in favour of infants only.

PARONOMASIA, παρονομασια, in rhetoric, a pun; or a figure whereby words nearly alike in ſound, but of very different meanings, are affectedly or deſignedly uſed; thus Tully to Antony, *cum in gremio mimorum* mentem *&* mentum *deponeres.*

PARONYCHIA, WHITLOW, in medicine, an inflammatory and exceeding painful diſorder, which inveſts all the joints, and particularly the ends of the fingers; being generally much ſwelled with a beating or throbbing and intenſe heat. There is ſometimes little or no tumour obſerved, when the diſorder lies deep at, or in the bone; and ſometimes again the tumour, pain, and inflammation are extended from the finger, up to the elbow, or even to the ſhoulder, from the communication of the fingers with thoſe parts by the flexor-muſcles. In ſome conſtitutions this diſorder excites a raging fever with faintings, convulſions, deliriums, an abſceſs, or ſphacelus of the parts; and without timely aſſiſtance death itſelf. Heiſter diſtinguiſhes three ſpecies of the paronychia; the firſt is when only the integuments are affected, at the end of the finger, either in its back or fore-part, or near the nail; in which caſe the ſymptoms are not uſually very malignant, though the pain be extremely acute: the ſecond kind is when the perioſteum is inflamed or eroded, in which caſe the ſymptoms are more or leſs violent than the preceding, in proportion as that membrane is more or leſs violently affected: the third and worſt ſpecies of this diſorder is that inveſting the nervous involucra or coverings of the tendons, belonging to the flexor-muſcles of the fingers, or even the adjacent nerves or tendons themſelves; for in that caſe the diſorder often appears with the moſt excruciating pains, and a train of the moſt malignant ſymptoms.

The true and proximate cauſe of a paronychia, in our author's opinion, ought to be referred to an inflammation of the adjacent integuments, chiefly of the perioſteum, from an inſpiſſation of the blood, or an obſtruction of its ſmall veſſels: this inflammation may again proceed from an internal or external cauſe, acting ſeparately or combined; ſuch as an inſpiſſation or acrimony of the blood and lymph, induced by a tenſe fibre, and a heating regimen, or an abuſe of the non-naturals, joined with a contuſion, wound, puncture, or with the ſtimulus of a foreign body.

For the cure of a paronychia, Garengeot propoſes inciſion before any trial has been made with other remedies; but Heiſter, agreeably to the advice of Hippocrates,

pocrates, is of opinion, that the diforder may be frequently difperfed and removed by the ufe of diluent, difcutient, and cooling remedies, without an incifion. The moft approved method for removing an inflammation and obftruction in this manner, is to let the patient hold his finger, for feveral hours, in fpirit of wine, highly rectified, and in which has been infufed camphor or theriaca. See DISPERSION, DISCUTIENTS, &c.

But when there is already a fuppuration actually formed, either before or under the ufe of thefe means, then an incifion is the only remedy. In the firft fpecies of this diforder, the furgeon, as foon as he perceives the matter to point, or form a little protuberance, ought to hold and prefs it betwixt the finger and thumb of his left hand, while he makes a longitudinal incifion therein, with his right, by which means the matter being difcharged, the finger will then heal almoft of itfelf. In the fecond fpecies of the paronychia, an incifion is to be made according to the preceding directions; only then more care is to be taken, that the knife penetrate to the bone: the incifion being made, the blood fhould be fuffered to flow out a little while, either of itfelf, or elfe it fhould be preffed out: then the wound is to be dreffed with dry lint, and diachylon-plafter, with a comprefs dipped in warm fpirit of wine, and retained on by a proper bandage: the wound is next to be treated like thofe in which the bones are affected; *viz.* with effence of myrrh, amber, balfam of Peru, &c.

In the third and laft kind of this diforder, which our author confeffes never occurred to his obfervation, the fmall tumour is firft to be opened, by making an incifion longitudinally, down into the capfule of the tendon, which will difcharge a kind of lymph, or ferum. If the internal finus of the paronychia is in the middle part, or fecond joint of the finger, and is laid open fo far by incifion, in that cafe M. Petit advifes to continue the incifion even down for above a quarter of an inch into the hand: the dreffings may be much the fame as in the preceding cafe.

PAROS, one of the fmalleft iflands of the Cyclades, famous for its marble, fituated in eaft long. 25° 30′, north lat. 36° 30′.

PAROTIDES, in anatomy, two very remarkable glands, fituated one on each fide, between the ear and the angle of the lower jaw, and often extending themfelves over a great part of the maffeter. From each of thefe glands there runs a very large duct, about three fingers-breadth long, and of the thicknefs of a wheat-ftraw, having a great number of roots: this duct, from Steno, the difcoverer, is by fome called ductus falivalus ftenonius, by others ductus falivalus fuperior. It paffes over the maffeter-mufcle, thro' the middle of the cheek, and there perforates the buccinator-mufcle, and the membrane of the mouth, near the fecond or third of the dentes morales, and at this perforation it difcharges a very large quantity of its proper fluid into the mouth. The parotides are among thofe glands that ferve for the fecretion of the faliva. See the articles GLAND and SALIVA.

PAROTIDES is alfo the name of certain tumours or inflammations arifing behind the ears, on the parotid glands.

Thefe tumours are very frequent after malignant and peftilential fevers. Children are alfo very particularly liable to them. They are of the fame nature, and are to be treated in like manner with the buboes. See the article BUBO.

PAROXYSM, in medicine, the fevere fit of a difeafe, under which it grows higher, or exafperates, as of the gout, &c.

It is alfo ufed for the accefs or return of a difeafe that intermits, as an ague, &c.

PARRELS, in a fhip, are frames made of trucks, ribs, and ropes, which having both their ends faftened to the yards, are fo contrived, as to go round about the mafts; that the yards, by their means, may go up and down upon the mafts: thefe alfo, with the breaft-ropes, faften the yards to the mafts.

PARRICIDE, *parricida* or *patricida*, ftrictly fignifies the murder or murderer of a father, as matricide does of a mother; yet this word is ordinarily taken in both fenfes, and is alfo extended to the murder of any near relation, as hufband, wife, brother, fifter, child, grand-child, uncle, &c. and even to that of great or facred perfons, though no way allied in blood, as a king, &c.

PARROQUET, in ornithology, a fubdivifion of parrots. See the next article.

PARROT, *pfittacus*, a genus of birds, of the order of the accipitres, the characters of which are thefe; the beak is of a hooked or uncinated figure; and the toes are four on each foot, two forwards and two backwards.

There are three divifions of this genus: 1. The larger fpecies, called macao, of which

which there are a great many very elegant species, particularly the erythrocyaneus. See Erythrocyaneus.

2. The smaller kind, properly called parrots, make a very numerous and very beautiful tribe of birds.

3. The lesser kind, commonly called paroquettes, are likewise very numerous and very beautiful birds.

PARRYING, in fencing, the action of warding off the blows aimed at one by another. See the article Fencing.

PARSLEY, *petroselinum* or *apium*, in botany. See the article Apium.

Parsley-seeds, whether in powder or decoction, is an excellent carminative, as is also its distilled oil.

Parsley-root is one of the five greater opening roots: it is attenuant, aperient, detergent, and diuretic; and is prescribed in diet-drinks, in chronic cases arising from obstructions of the viscera: and in any form, it is a powerful diuretic.

PARSNEP, *pastinaca*, in botany, a genus of the pentandria-digynia class of plants, the universal flower of which is uniform, and the particular ones composed of five lanceolated petals, bending inwards; the fruit is composed of two large, flattish, marginated seeds.

The seeds of the wild parsnep are carminative, and therefore good in flatuses and colics: they are also said to be diuretic, aperient, and to promote the menses.

PARSON, the rector or incumbent of a parish-church. See the articles Church and Clergy.

It is said, there may be two several parsons in the same church, one of the one moiety, and one of the other, wherein a part of the church and town is allotted to each of them; and there may also be two clergymen, who make but one parson in a church, where they are presented by the same patron. Where a person is a complete parson, made so by presentation, institution, and induction, he may cease to be a parson of the church divers ways, as by cession, where he resigns or is deprived, either for simony, nonconformity to the canons, adultery, &c. Parsons ought generally to abide on their rectories, and live in the parsonage-house, unless it be in cases of sickness, &c. they are prohibited to take farms or leases of land, on pain of 10 l. per month, forfeiture; and may not buy to sell again any merchandize, &c. which makes them liable to forfeit triple value.

Parson imparsonée, signifies one that is in possession of a church, whether it be presentative or impropriate, and with whom the church is then full.

Persona impersonata is a plea in the writ quare impedit, that the parson is admitted and instituted in the church, &c.

PARSONAGE, a rectory or parish-church, endowed with a house, glebe, lands, tithes, &c. for the maintenance of a minister, with cure of souls within such parish. There may, notwithstanding, be a parsonage without either glebe or tithes, but only annual payments instead thereof. As to the rights to the parsonage and church, they are of several natures; the right of the parson concerns the possession of it; that of the patron, his presentation; and the ordinary, his investiture, &c. but no charge can be laid thereon, without the consent and agreement of all of them. If the parson wastes the inheritance of the church, by cutting down trees, &c. his patron may have a prohibition.

PART, *pars*, a portion of some whole, considered as divided or divisible.

Part, according to Chauvinus, is usually distinguished into logical and physical. Logical part is that referring to some universal as its whole; in which sense, the species are parts of a genus; and individuals, or singulars, are parts of the species. Physical part, is that which, tho' it enters the composition of a whole, may yet be considered apart, and under its own distinct idea; in which sense, a continuum is said to consist of parts. It is controverted in the schools, whether the parts of a continuum, or physical whole, *e. gr.* water, do exist actually before the division be made, or only potentially. Physical parts, again, are of two kinds, homogeneous and heterogeneous: the first are those of the same denomination with the other; the second, of a different one. See Homogeneous, &c.

Parts, again, are distinguished into subjective, essential, and integrant. Subjective or potential part is the same with logical part, *viz.* that contained in some universal whole, not in act, but only in power; as man and horse are in animal, Peter and Paul in man. Essential part is that whereby, with the concurrence of some other, an essential whole is constituted: thus, the body and soul are essential parts of man. Integrant or integral part, is that which is necessary to the integrity of the whole, as a head is of a man, &c.

Consent of Parts, in medicine. See the article Consent.

Part, in geometry and astronomy, is applied to the division of lines and circles, *&c.*

Aliquot Part, and *Aliquant* Part, in arithmetic. See the article Aliquot and Aliquant.

Proportional Part, is a part or number agreeable and analogous to some other part or number; or a medium to find some number or part unknown, by proportion and equality of reason.

Similar Parts, are those which are to one another, as their wholes are to one another.

Organical Part. See Organical.

Part, in music, denotes a piece of the score, or partition, written by itself, for the conveniency of the musician; or it is one or more of the successions of sounds, which make the harmony, written apart. Or, the parts are the sounds made by several persons, singing or playing in concert.

Music in parts was unknown to the antients; they had but one part: all their harmony consisted in the succession of notes, none in the consonance.

There are four principal parts, the treble, bass, tenor, and counter-tenor. Some compare the four parts in music to the four elements; the bass, they say, represents the earth; the tenor, the water; counter-tenor, air; and treble, fire.

Parts *of speech*, in grammar, are all the sorts of words which enter the composition of discourse. See Speech.

The grammarians generally admit of eight parts of speech, *viz.* noun, pronoun, verb, participle, adverb, preposition, interjection, and conjunction. See the articles Noun, Pronoun, *&c.*

Part *of fortune*, in the judicial astrology, is the lunar horoscope, or the point wherein the moon is, at the time when the sun is in the ascending part of the east. The sun in the ascendant, is supposed, according to this science, to give life, and the moon dispenses the radical moisture, and is one of the causes of fortune. In horoscopes, the part of fortune is represented by a circle divided by a cross. See the article Horoscope.

Part, or Depart, in the manege, a word used to signify the motion and action of a horse, when put on at full speed. From the horse's parting to his stop, there are commonly two hundred paces of ground. To make your horse part with a good grace, you must put your bridle three fingers lower, and press gently with your heels, or with the calves of your legs.

PARTENKIRK, a town of Germany, in the circle of Bavaria, situated forty miles south-west of Munich.

PARTENAY, a town of France, in the province of Orleanois, and territory of Poictou, situated thirty miles west of Poictiers.

PARTERRE, in gardening, a level division of ground, which, for the most part, faces the south, and best front of an house; and is generally furnished with greens, flowers, *&c.*

There are several sorts of parterres, as plain grass with borders, and parterres of embroidery, *&c.* Plain parterres are more beautiful in England than in any other country, by reason of the excellency of our turf, and that decency and unaffected simplicity that it affords to the eye of the spectator. Other parterres are cut into shell and scroll-work, with sand-alleys between them; which sort of parterres are esteemed finest in France. As to the general proportions of parterres, an oblong or long square is esteemed the best: therefore a parterre should not be less than twice as long as it is broad; twice and a half is accounted a very good proportion; and it is very rare that three times is exceeded. As to the breadth of a parterre, it is to take its dimensions from the breadth of the front of the house; if the front of the house is one hundred feet long, the breadth of the parterre should be one hundred and fifty feet; and if the front of the house be two hundred feet, the parterre should be fifty feet broader: but where the front exceeds the breadth of this parterre, it will be a good proportion to make the parterre of the same dimensions with the front. There should be a terrace-walk on each side of the parterre, for an elevation proper for view; and, therefore, there should never be the flat of a parterre between terrace-walk and terrace-walk above three hundred feet; nor can it be well made less than one hundred and forty. As to the adorning and furnishing these parterres, whether it be plain or with embroidery, that depends much upon the form of them, and therefore must be left to the judgment and fancy of the designer.

PARTHENIUM, american fever-few, in botany, a genus of the monoecia-

pen-

pentandria clafs of plants, the compound flower of which is convex; there are feveral corollulæ in the difc, which are monopetalous, tubulofe, ligulated, erect, quinquifid at the mouth, and of the length of the cup; the female flowers are alfo monopetalous, but they are tubulated, ligulated, oblique, obtufe, roundifh, and of the length of the hermaphrodite ones; they are five in number, and are placed in the verge or radius: there is no other fruit but the cup, which remains upon the plant unaltered: the feed in the hermaphrodite flowers is abortive; and in the female, it remains in the cup, and is fingle, of a turbinato-cordated form, compreffed, and naked.

The leaves and flowers of this plant are recommended in frigid and flatulent affections of the uterus, in obftructions of the menfes, in venereal weakneffes, and in the dropfy. They are alfo of great ufe in putrid fevers, the ftone in the kidney, vertigo, and arthritis.

PARTHIA, a country of Afia, formerly fo called, fituated almoft in the middle of the modern Perfia.

PARTI, Partie, Party, or Parted, in heraldry, is applied to a fhield or efcutcheon, denoting it divided or marked out into partitions. See Shield, &c.

The french heralds, from whom we borrow the word, have but one kind of parti, the fame with our parti per pale, which they fimply call parti: but with us the word is applied to all forts of partitioning, and is never ufed without fome addition, to fpecify the particular kind intended; thus we have parti or parted per crofs, per chief, per pale, per fefs, per bend dexter, per bend finifter, per chevron, &c. See Quartering.

The humour of our anceftors, Columbier obferves, turning much upon exploits of arms and chivalry, they ufed to preferve their battered and hacked armour as honourable fymbols of their hardy deeds; and thofe who had been in the hotteft fervice, were diftinguifhed by the moft cuts and bruifes that appeared on their fhields. To perpetuate the memory hereof, fays the fame author, they caufed them to be painted on their fhields, and thus handed down to pofterity. And when heraldry grew into an art, and officers were appointed to direct the manner of bearing and blazoning, they gave names to thofe cuts, anfwerable to the nature thereof, appointing four, from which all the others proceed; thefe are parti, called by our heralds parti per pale; couped, parti per fefs; tranche, parti per bend dexter; and taille, parti per bend finifter. See Couped, &c.

Parti per pale is when the fhield is divided perpendicularly into two halves, by a cut in the middle from top to bottom. See plate CXCIII. fig. 3.

Parti per fefs is when the cut is acrofs the middle, from fide to fide.

Parti per bend dexter, is when the cut comes from the upper corner of the fhield, on the right hand, and defcends athwart to the oppofite lower corner.

Parti per bend finifter, is when the cut, coming from the upper left corner, defcends acrofs to the oppofite lower one.

From thefe four partitions have proceeded an infinite number of others, of various and extravagant forms.

PARTICIPATION, that which gives a part or fhare in any thing, either by right or grace.

PARTICIPLE, *participium,* in grammar, an adjective formed of a verb, fo called becaufe it participates partly of the properties of a noun, and partly of thofe of a verb; being variable through genders and cafes, like the former; and regarding time, action, paffion, &c. in manner of the latter. See the articles Noun and Verb.

Thus the participle retains the attribute of the verb; and, moreover, the defignation of the time or tenfe; there being participles of the prefent, the præterite, and future, efpecially in Greek: but this is not always obferved, the fame participle being frequently joined with all forts of tenfes. There are active and paffive participles; the active, in latin, end in *ans* or *ens,* as *amans, docens*; the paffive in *us,* as *amatus, doctus*; tho' there are fome of thefe that are active, namely thofe of verbs deponents, as *locutus.* But there are others likewife which add to this paffive fignification a fort of compulfive, or obligatory fenfe; thefe are the participles in *dus,* as *amandus, which ought to be loved*; though fometimes the latter fignification is entirely loft.

The property of the participles of verbs active, is to fignify the action of the verb, as it is in the verb, that is, in the courfe of the action itfelf; whereas the verbal nouns, which fignify actions alfo, fignify them rather in the habit than in the act: for which reafon the participles have the fame government as the verb, as *amans deum*; whereas verbal nouns have only the

ſame government as nouns, as *amator dei*: and the participle itſelf has the ſame government as nouns when it ſignifies rather the habit than the act of the verb, by reaſon it then has only the nature of a ſimple noun verbal, as *amans virtutis*.

In our language, the participles and gerunds are not at all diſtinguiſhable.

PARTICLE, in phyſiology, the minute part of a body, an aſſemblage of which conſtitute all natural bodies. See the articles ATOM and MATTER.

It is the various arrangement and texture of theſe particles, with the difference of cohesion, &c. that conſtitute the various kinds of bodies. The ſmalleſt particles cohere with the ſtrongeſt attraction, and compoſe bigger particles of weaker coheſion, and many of theſe cohering compoſe bigger particles, whoſe vigour is ſtill weaker; and hereupon the operations in chemiſtry, and the colours of natural bodies depend, and which, by cohering, compoſe bodies of ſenſible bulk. The coheſion of the particles of matter, the epicureans imagined, was effected by means of hooked atoms; the ariſtotelians, by reſt; but Sir Iſaac Newton ſhews, that it is done by means of a certain power, whereby the particles mutually attract and tend towards each other. By this attraction of the particles, he ſhews, that moſt of the phænomena of the leſſer bodies are affected, as thoſe of the heavenly bodies are, by the attraction of gravity. See ATTRACTION and GRAVITATION.

PARTICLE, in grammar, a denomination for all thoſe ſmall words that tie or unite others together, or that expreſs the modes or manners of words, uſually included by grammarians under theſe four parts of ſpeech, *viz.* adverbs, prepoſitions, interjections, and conjunctions. See the articles PARTS *of ſpeech*, ADVERB, &c.

Mr. Locke obſerves, that it is in the right uſe of particles, the clearneſs and beauty of a good ſtyle more particularly conſiſts. To expreſs the dependence of his thoughts and reaſonings, one upon another, a man muſt have words to ſhew what connection, reſtriction, diſtinction, oppoſition, emphaſis, &c. he gives to each reſpective part of his diſcourſe. This cannot be rightly underſtood without a clear view of the poſtures, ſtands, turns, limitations, exceptions, and ſeveral other thoughts of the mind. Of theſe there is a great variety, much exceeding the number of particles that moſt languages have to expreſs them by; for which reaſon it happens, that moſt of theſe particles have divers, and ſometimes almoſt oppoſite ſignifications.

PARTICULAR, *particularis*, a relative term referring to ſpecies or individual, and oppoſed to general or univerſal. See the articles SPECIES and GENERAL.

There is this difference between particular and ſingular, that particular denotes a thing taken as a part, as Peter in reſpect of mankind; whereas ſingular denotes the part taken after the manner of a whole, as Peter conſidered in himſelf. See the article SINGULAR.

PARTIES, in law, ſignify the perſons that are named in a deed or fine, *viz.* thoſe that made the deed, or levied the fine, and alſo thoſe to whom the ſame was made or levied.

Here it is to be obſerved, that if an indenture was made between two parties, mentioned particularly in the beginning of the deed, and therein one of them grants to another that is not named at the beginning thereof, ſuch perſon is no party to that deed, nor can take any thing thereby. The parties to a ſuit at law are the plaintiff and defendant, who carry on the ſuit.

PARTING, or DEPARTING, a method of ſeparating gold and ſilver, by means of aqua fortis; for the operation of which ſee ASSAYING and QUARTATION.

PARTITION, in law, ſignifies a diviſion of lands, &c. deſcended by common law or cuſtom among coheirs or parceners, being two at leaſt. Partition may alſo be made by joint tenants, and tenants in common by aſſent, deed, or writ. See the article CO-PARCENERS.

PARTITION, in rhetoric, the ſame with diviſion. See the article DIVISION.

PARTITION, in muſic, the diſpoſition of the ſeveral parts of a ſong ſet on the ſame leaf, ſo as upon the uppermoſt ranges of lines are found the treble; in another, the baſs; in another, the tenor, &c. that they may be all ſung or played, either jointly or ſeparately. See the articles PART, MUSIC, &c.

PARTITION, in architecture, that which divides or ſeparates one room from another. See the article BUILDING.

PARTITION, in heraldry. See the article QUARTERING.

PARTITIONE FACIENDA, in law, a writ which lies for thoſe who hold lands or tenements pro indiviſo, and would

ſever

ſever to every one his part, againſt them that refuſe to join in partition, as copartners.

PARTNER and PARTNERSHIP. See the article FELLOWSHIP, &c.

If there be ſeveral joint partners, and a perſon has dealings generally with one of them in matters concerning their joint trade, whereby a debt becomes due to the ſaid perſon, it ſhall charge them jointly and the ſurvivors of them; but if the perſon only dealed with one of the partners upon a ſeparate account, in that caſe the debt ſhall only affect that partner and his executors. If one or more of the joint traders become bankrupt, his or their proportions are only aſſignable by the commiſſioners, to be held in common with the reſt who are not bankrupts. If one of two partners becomes a bankrupt, the commiſſioners cannot meddle with the intereſt of the other, for it is not affected with the bankruptcy of his companion. Payment to one of the partners, is payment to them all.

PARTNERS, in a ſhip, are ſtrong pieces of timber bolted to the beams incircling the maſts, to keep them ſteady in their ſteps, and alſo keep them from rolling, that is, falling over the ſhip's ſides. There are alſo of theſe partners at the ſecond deck, to the ſame end; only the mizen-maſt hath but one pair of partners, in which that maſt is wedged ſo firm that it cannot move. Some ſhips do not ſail well, unleſs their maſts are looſe, and have leave to play in the partners; but in a ſtorm this is dangerous, leſt the partners ſhould be wronged, (as they ſay) *i. e.* forced out of their places; for then there is no help but to cut the maſt by the board.

PARTRIDGE, in ornithology, is a ſpecies of tetrao, with a naked ſcarlet mark behind the eyes. See TETRAO.

The common partridge is too well known, to need a farther deſcription: it is common in fields, and called by authors perdix. But beſides the common kind, there is another ſomewhat larger ſpecies, called the red-legged partridge, with a grey tail, variegated in the upper part with brown.

Partridges are caught by means of nets, bird-lime, ſetting-dogs, &c. as alſo by driving. See NET, BIRD-LIME, &c.

PARTURITION, the ſame with delivery. See the article DELIVERY.

PARTY, in politics, denotes a faction conſidered as oppoſing another: ſuch are the whigs and tories. See the articles WHIG and TORIES.

In law, party-jury is one impanelled in actions brought for or againſt foreigners. See the article MEDIETAS LINGUÆ.

In a military ſenſe, party denotes a ſmall body of men, whether foot or horſe, or both, ſent on ſome expedition.

PARTY, or PARTI, in heraldry. See the article PARTI.

PARU, in ichthyology, a ſpecies of chætodon. See the article CHÆTODON.

PARULIDES, in ſurgery, tumours and inflammations of the gums, commonly called gum-boils.

They are to be treated with diſcutients, like other inflammatory tumours. Sage, camomile and elder-flowers, boiled in milk or water, make a gargariſm to be held in the mouth warm; and the remaining herbs may be ſowed up in a bag, and applied hot to the cheeks. See the article DISPERSION.

But if the diſorder cannot be thus diſperſed, emollient applications of mallows, &c. are good; and to forward the maturation externally, a half-roaſted fig may be applied: and when the ſoftneſs of the tumour ſhews that the matter is ſuppurated, it ought immediately to be opened by the lancet, to prevent the matter's lodging there, and eroding the bone, and producing a fiſtula or caries. After it is opened, the matter ſhould be gently preſſed out with the fingers, and the mouth frequently waſhed with red wine mixed with a decoction of vulnerary herbs till it is well. When the ulcer has penetrated deep, it will be neceſſary to inject the ſame liquors with a ſyringe, and compreſs the part by a proper external bandage, to make the bottom part heal firſt; and when it is already become fiſtulous, and has callous edges, it may then often be cured by injecting tincture of myrrh, and elixir proprietatis, continuing this for ſome time. If all theſe prove ineffectual, the fiſtula muſt be laid open by inciſion, and the caries removed by medicines, cauſtics, or the actual cautery. If this proceeds, as ſometimes it does, from a carious tooth, this is firſt of all to be extracted, otherwiſe the tumour will degenerate into a fiſtula: and it is always beſt to be early in making the inciſion.

PARUS, the TITMOUSE, in ornithology. See the article TITMOUSE.

PARYPATE, in the antient muſic. See the article DIAGRAM.

PAS, a town of the french Netherlands, twelve miles fouth-weft of Arras.

PASCHAL, fomething belonging to the paffover or eafter. See the articles PASSOVER and EASTER.

PASCHAL LETTER. See LETTER.

PASLEY, a town of Scotland, in the county of Renfrew, fix miles weft of Glafgow.

PASQUIN, a mutilated ftatue at Rome, in a corner of the palace of the Urfini: it takes its name from a cobler of that city called Pafquin, famous for his fneers and gibes, and who diverted himfelf with paffing his jokes on all the people who went through that ftreet. After his death, as they were digging up the pavement before his fhop, they found in the earth the ftatue of an antient gladiator, well cut, but maimed, and half fpoiled: this they fet up in the place where it was found, and by common confent named it Pafquin. Since that time all fatires are attributed to that figure, and are either put into its mouth or pafted upon it, as if they were wrote by Pafquin redivivus; and thefe are addreffed by Pafquin to Marforio, another ftatue at Rome. When Marforio is attacked, Pafquin comes to his affiftance; and when Pafquin is attacked, Marforio affifts him in his turn.

PASQUINADE, a fatirical libel faftened to the ftatue of Pafquin: thefe are commonly fhort, merry, and pointed; and from hence the term has been applied to all other lampoons of the fame caft. The difference between a pafquinade and a fatire is, that the end of the latter is to correct and reform, while that of the former is only to ridicule and expofe.

PASS, a ftrait, difficult, and narrow paffage, which fhuts up the entrance into a country.

The firft care of the general of an army is to feize the paffes of the country into which he would carry the war, to fortify them, and take care that they are well guarded.

PASS *of arms*, in chivalry, a bridge, road, *&c.* which the antient knights undertook to defend.

The knights who held a pafs, hung up their arms on trees, pales, columns, *&c.* erected for that purpofe; and fuch as were difpofed to difpute the pafs, touched one of the pieces of armour with his fword, which was a challenge the other was obliged to accept; when the vanquifhed gave the victor fuch a prize as was before agreed on.

PASS, or PASSADE, in fencing, an advance or leap forward upon the enemy. Of thefe there are feveral kinds, as paffes within, above, beneath, to the right, the left, and paffes under the line, *&c.* The meafure of the pafs is, when the two fmalls of the fwords are fo near, as that they may touch one another.

PASSADE, in the manege, is a turn or courfe of a horfe backwards or forwards, on the fame fpot of ground. Hence there are feveral forts of paffades, according to the different ways of turning, in order to part, or return upon the fame tread, which is called clofing the paffade; as the paffade of one time, the paffade of five times, and the raifed or high paffades, in which the demi-volts are made into curvets. See the articles CURVET and VOLT.

In all paffades the horfe, in making the demi-volt, fhould gather and bring in his body, making his haunches accompany his fhoulders, without falling back, or not going forward enough each time; and he fhould go in a ftrait line, without traverfing or turning his croup out of the line.

PASSAGE, in the manege, is a horfe's walking or trotting in fuch a manner that he raifes the outward hind-leg, and the inward fore-leg together; and fetting thefe two on the ground, raifes the other two alternately, never gaining above a foot of ground at a time. A horfe is paffaged upon two ftrait lines along a wall or hedge, and alfo in going fideways in a circle round a center. The beauty of the paffage confifts in holding the legs long in the air.

PASSAGE, or PASSO, in mufic, a part of an air or tune, confifting of feveral fhort notes, as quavers, femi-quavers, *&c.* lafting one, two, or at moft three meafures, in the beginning of a piece, which is to be afterwards imitated in the other notes of the piece, not with the fame chords or notes, but only by obferving the fame motion, number and figure, as in the notes of the firft paffage. This is called by the Italians contrapunto d'un fol paffo.

Birds of PASSAGE, a name given to thofe birds which at certain ftated feafons of the year remove from certain countries, and at other ftated times return to them again, as our quails, woodcocks, ftorks, nightin-

nightingales, swallows, and many other species. The generality of birds that remain with us all winter have strong bills, and are enabled to feed on what they can find at that season; those which leave us, have usually very slender bills, and their food is the insects of the fly-kind; which disappearing towards the approach of winter, compel them to seek them in the warmer regions where they are to be found. Among the birds of passage, the fieldfare, the redwing, the woodcock, and the snipe, come to us in the autumn, at the time when the summer birds are leaving us, and go from us again in spring, at the time when these return; and of these the two last often continue with us through the summer, and breed; so that the two first seem the only kinds that certainly leave us at the approach of spring, retiring to the northern parts of the continent, where they live during the summer, and breed; and at the return of winter, are driven southerly from those frigid climes, in search of food, which there the ice and snow must deprive them of.

Right of PASSAGE, in commerce, is an imposition or duty exacted by some princes, either by land or sea, in certain close and narrow places in their territories, on all vessels and carriages, and even sometimes on persons or passengers coming in or going out of ports, *&c.* The most celebrated passage of this kind in Europe is the Sound, the dues for passing which strait belong to the king of Denmark, and are paid at Elsenore or Cronenburg.

PASSAGE, in geography, a port-town of Spain, in the province of Biscay, sixty miles east of Bilboa.

PASSANT, in heraldry, a term applied to a lion, or other animal, in a shield, appearing to walk leisurely: for most beasts, except lions, the term trippant is frequently used instead of passant.

PASSAO, or CAPE PASSAO, a promontory of Peru, just under the equator: west long. 81°.

PASSAU, the capital of the bishopric of the same name, in the circle of Bavaria, situated on the confluence of the rivers Danube, Inn, and Ilts: east long. 13° 30′ north lat. 48° 30′.

PASSER, the SPARROW. See SPARROW.

PASSERES is also the name of a class of birds, with a conic and much attenuated beak. See ORNITHOLOGY.

PASSER FLUVIATILIS, a name used by some for the common flounder.

PASSERINA, in botany, a genus of the octandria-monogynia class of plants, the flower of which is composed of a single petal, divided into four oval segments at the limb: the fruit is a coreaceous capsule, of an oval shape, with only one cell, and containing a single oval seed, pointed at each end.

PASSIFLORA, PASSION-FLOWER, in botany, a genus of the gynandria-pentagynia class of plants, the corolla of which consists of five petals, of the largeness and figure of those of the cup: the fruit is a berry, supported on a pedicle. This is an extremely beautiful flower, a species of which, called murucuja, or the lunated-leaved, scarlet, passion-flower, is represented in plate CXCIV. fig. 8.

PASSIONS, in moral philosophy, are certain motions of the soul, which make it pursue what appears to be good, and avoid whatever threatens evil. See the articles GOOD and EVIL.

By reflecting, says Mr. Locke, on the various modifications or tempers of the mind, and the internal sensations which pleasure and pain, good and evil produce in us, we may thence form to ourselves the ideas of our passions. Thus, by reflecting upon the thought we have of the delight which any thing is apt to produce in us, we form an idea which we call love. Desire is that uneasiness which a man finds in himself upon the absence of any thing, the present enjoyment of which causes delight. Joy is a delight of the mind, arising from the present, or assured approaching, possession of some good. Sorrow is an uneasiness of the mind, upon the thought of a good lost, or the sense of a present evil. Hope is a pleasure in the mind, upon the thought of a probable future enjoyment of a thing which is apt to delight. Fear is an uneasiness of the mind, upon the thought of a future evil likely to befal us. Anger is a discomposure of the mind, upon the receit of injury, with a present purpose of revenge. Despair is the thought of the unattainableness of any good. Envy is an uneasiness of mind, caused by the consideration of a good we desire, obtained by one we think should not have had it before us.

On the just regulation and subordination of the passions, depends, in a great measure, the happiness of mankind. See the articles ETHICS and HAPPINESS.

It ought to be observed here, in reference to the passions, that the removal or lessening

ſening of a pain is conſidered, and operates as pleaſure; and the diminiſhing of a pleaſure as pain; and, farther, that the paſſions in moſt perſons operate on the body, and cauſe various changes in it; whence the conſideration of them in medicine and painting.

Passions, in medicine, make one of the non-naturals, and produce very ſenſible effects. Joy, anger, and fear are the principal. In the two firſt, the ſpirits are hurried with too great vivacity; whereas, in fear or dread, they are as it were curbed and concentrated: whence we may conclude, that they have a very bad effect upon health; and therefore it will be beſt to keep them within bounds as much as poſſible, and to preſerve an inward ſerenity, calmneſs, and tranquility. Continual ſorrow and anguiſh of mind render the fluids thick, and generate viſcid and acid crudities in the ſtomach, and at length render the body unapt for a due circulation; whence proceed obſtructions of the viſcera, and many chronical diſorders. Anger conſtringes the bilious veſſels in particular, and cauſes too great an evacuation of the bile; produces ſtrictures in the ſtomach and duodenum; whence the bilious humours are amaſſed and corrupted; laying a foundation for vomiting, bilious fevers, and cardialgiæ.

The paſſions of the mind, in general, chiefly affect the ſtomach, invert its motion, hinder digeſtion and chylification; whence many crudities ariſe, fruitful of various diſeaſes: hence it is very dangerous, after violent commotions of the mind, to ſit down to a meal; or, during that time, to be greatly affected with any accident that may happen.

For the treatment of the iliac, hypochondriac, coeliac, hyſteric, &c. paſſion, ſee the articles Iliac, &c.

Passions, in painting, are the external expreſſions of the different diſpoſitions and affections of the mind; but particularly their different effects upon the ſeveral features of the face: for though the arms, and indeed every part of the body, ſerve likewiſe, by their quick, languid, and variouſly diverſified motions, to expreſs the paſſions of the ſoul; yet, in painting, this difference is moſt conſpicuous in the face.

In ſorrow, joy, love, ſhame, and compaſſion, the eyes ſwell all of a ſudden, are covered with a ſuperabundant moiſture, and drop tears; and in grief eſpecially, the corners of the mouth hang down, the eye-lids are half ſhut, and the pupil of the eye is elevated and half covered; and all the other muſcles of the face are relaxed, ſo that the viſage appears longer than ordinary.

In fear, terror, fright, and horror, the eye-brows are greatly elevated, the eye-lids are expanded as wide as poſſible, ſo as to diſcover the white of the eye, and the pupil is depreſſed and half covered by the lower eye-lid; the hair ſtands an end; the mouth is at the ſame time wide open, and the lips ſo far drawn back, that the teeth both of the upper and under jaw appear.

Contempt is expreſſed by raiſing one ſide of the upper-lip, ſo as to diſcover the teeth, whilſt the other ſide has a movement like that in laughter; the eye, on that ſide where the teeth appear, is half ſhut, whilſt the other remains open; however, both the pupils are depreſſed.

In jealouſy, envy, hatred, and malice, the eye-brows are knit; and, in laughter, all the parts agree, tending as it were towards the center of the face.

Mr. le Brun has been extremely happy in expreſſing the ſeveral paſſions, and the examples he has left of them deſerve imitation.

Passions, in poetry, are of ſingular uſe in diſtinguiſhing the characters of the actors. See the article Character.

But though the paſſions be always neceſſary, yet all are not equally ſuitable to every kind of poetry: thus comedy has joy and agreeable ſurpriſe for its part; tragedy, on the contrary, has terror and compaſſion; and epic, as a medium between the two, takes in both theſe kinds of paſſions, though its proper paſſion is admiration. See the articles Comedy, Tragedy, and Epic.

Passion, *or croſs of the* Passion, in heraldry, is ſo called, becauſe reſembling the ſhape of that on which our Saviour is thought to have ſuffered; that is, not croſſed in the middle, but a little below the top, with arms ſhort in proportion to the length of the ſhaft. See plate CXCIV. fig. 5.

Passion flower, *paſſiflora*, in botany. See the article Passiflora.

Passion-week, the week immediately preceding the feſtival of Eaſter: ſo called, becauſe in that week our Saviour's paſſion and death happened. See Easter.

The Thurſday of this week is called Maunday-Thurſday; the Friday, Good-Friday;

Friday; and the Saturday, the great Sabbath.

PASSIVE, in general, denotes ſomething that ſuffers the action of another, called an agent, or active power. See the articles AGENT and ACTIVE.

In grammar, the verb or word that expreſſes this paſſion, is termed a paſſive verb; which, in the learned languages, has a peculiar termination, as *amor*, *doceor*, &c. in Latin; that is, an *r* is added to the actives *amo*, *doceo*: and, in the Greek, the inflection is made by changing ω into ὁμαι, as τύπτω, τύπτομαι, &c. But, in the modern languages, the paſſive inflection is performed by means of auxiliary verbs, joined to the participle paſſive; as *I am praiſed*, in latin *laudor*, and in greek ἐπαινέομαι; or *I am loved*, in latin *amor*, and in greek φιλέομαι. Thus it appears, that the auxiliary verb *I am*, ſerves to form the paſſives of engliſh verbs; and the ſame holds of the french, as *je ſuis loué*, I am praiſed; *j'aye eté loué*, I have been praiſed, &c.

PASSOVER, a ſolemn feſtival of the Jews, celebrated on the fourteenth day of the month next after the vernal equinox, and inſtituted in commemoration of their coming out of Egypt; becauſe on the night before their departure the deſtroying angel, who put to death the firſt-born of the Egyptians, paſſed over the houſes of the Hebrews, which were ſprinkled with the blood of a lamb. The whole tranſaction is related in the twelfth chapter of Exodus.

They were ordered before this feſtival to kill the paſchal lamb, and to ſprinkle their door-poſts with its blood; and the following night, which was the grand feaſt of the paſſover, and which was to continue ſeven days, they were to eat the lamb roaſted with a ſallad of wild-lettuces, or other bitter herbs, in the poſture of travellers; and if any part remained the day following, it was to be thrown into the fire; and for eight days together no leavened bread was to be uſed, on pain of being cut off from the people. The rabbins inform us of ſome other obſervances of the Jews in relation to the paſſover. They were ſo ſcrupulous in abſtaining from leavened bread during this feſtival, that they uſually examined every hole and corner of the houſe, that not the leaſt crumb of it might be concealed. On the vigil of the feaſt the matron of the family ſpread a table, and ſet on it two unleavened cakes, two pieces of the lamb, one boiled and the other roaſted, to put them in mind that God had delivered them with an out-ſtretched arm: to this they added ſome ſmall fiſhes, becauſe of the leviathan; a hard egg, becauſe of the bird ziz; ſome meal, becauſe of the behemoth: theſe three animals being, according to their rabbinical doctors, appointed for the feaſt of the elect in the other life. The father of the family ſat down with his children and ſlaves, took bitter herbs, eat them with muſtard, and diſtributed them. Then they eat of the lamb, the inſtitution of which was at that time recited by the maſter of the family, and the whole repaſt was attended with hymns and prayers. The modern Jews in general obſerve the ſame ceremonies.

PASS PAROLE, a command given at the head of an army, and thence communicated to the rear by paſſing it from mouth to mouth.

PASS-PAR-TOUT, a maſter-key; or a key that opens ſeveral locks belonging to the ſame houſe or apartment.

PASS-PORT, or PASS, a licence or writing obtained from a prince or governor, granting liberty and ſafe conduct to paſs through his territories without moleſtation.

Paſs-port alſo ſignifies a licence obtained for importing contraband goods, or for exporting and importing merchandize without paying the duties; theſe laſt licences are always given to embaſſadors and other public miniſters, for their baggage, equipage, &c.

If any perſon forge or counterfeit a paſſ-port, commonly called a Mediterranean paſs, for any ſhip, or ſhall alter or eraze any paſs made out by the commiſſioners for executing the office of lord high admiral, or ſhall publiſh as true any forged, altered, or erazed paſs, knowing the ſame to be forged, &c. every ſuch perſon being convicted in any part of his majeſty's dominions where ſuch offence may be committed, ſhall be guilty of felony without benefit of clergy, by 4 Geo. II. cap. 18. ſect. 1.

PASS-VOLANT, or PASSE VOLANT, in a military ſenſe, the ſame with a faggot. See the article FAGGOT.

In France all paſs-volants are marked on the cheek with a fleur de-lis.

PASTBOARD, a kind of thick paper formed of ſeveral ſheets of paper paſted together.

The chief uſe of paſtboard is in binding books,

books, making letter-cafes, &c. Pafteboards, on importation, pay the thoufand, 2 s. $6\frac{80}{100}$ d. and on exportation draw back 2 s. 3 d. and befides for every hundred weight 7 s. 6 d. which is drawn back on exportation.

PASTE, a compofition of water and flour, boiled to a confiftence; ufed by various artificers, as fadlers, upholfterers, bookbinders, &c.

In cookery, pafte is the compofition of flour, &c. wherein pies are baked: and in confectionary, pafte denotes a preparation of fome fruit, made by beating the pulp thereof with fome fluid, or other admixture; and afterwards drying it with fugar, till as pliable as common pafte.

PASTE, in the glafs-trade, a kind of coloured glafs, made of calcined cryftal, lead, and metallic preparations, fo as to imitate the natural gems; for the manner of effecting which, fee GEM.

PASTEL, a name by which fome call ifatis, or woad. See the article ISATIS.

PASTERN *of a horfe*, in the manege, is the diftance between the joint next the foot, and the coronet of the hoof. This part fhould be fhort, efpecially in middle-fized horfes, becaufe long pafterns are weak, and cannot fo well endure travelling.

PASTERN-JOINT, the joint next a horfe's foot.

When the paftern-joint fwells after travelling, chafe it every morning and evening with a mixture of two parts of brandy, and one of oil of nuts.

PASTIL, or PASTEL, among painters, a kind of pafte made of different colours, ground up with gum-water, in order to make crayons. See CRAYON.

Sometimes the crayons themfelves are called paftils.

PASTIL, in pharmacy, is a dry compofition of fweet-fmelling refins, aromatic woods, &c. fometimes burnt to clear and fcent the air of a chamber.

There are alfo paftils for the mouth, which being chewed, procure a fweet breath.

PASTINACA, the PARSNEP, in botany. See the article PARSNEP.

PASTINACA MARINA, the FIRE FLAIRE, in ichthyology, the name by which authors call the fmooth ray-fifh, with a long fpine in the tail, ferrated before. See the article RAY-FISH.

PASTO, a city of Popayan, in fouth America: weft long. 77°, north lat. 2°.

PASTOR, properly fignifies a fhepherd, but is now generally ufed for a parfon or minifter that hath cure of fouls. See the articles PARSON and CURE.

PASTORAL, in general, fomething that relates to fhepherds; hence we fay, paftoral life, manners, poetry, &c.

The original of poetry is afcribed to that age which fucceeded the creation of the world: and as the keeping of flocks feems to have been the firft employment of mankind, the moft antient fort of poetry was, probably, paftoral. It is natural to imagine, that the leifure of thofe antient fhepherds admitting and inviting fome diverfion, none was fo proper to that folitary and fedentary life as finging; and that in their fongs they took occafion to celebrate their own felicity. From hence a poem was invented, and afterwards improved to a perfect image of that happy time; which, by giving us an efteem for the virtues of a former age, might recommend them to the prefent. And fince the life of fhepherds was attended with more tranquility than any other rural employment, the poets chofe to introduce their perfons from whom it received the name of paftoral.

A paftoral is an imitation of the action of a fhepherd, or one confidered under that character. The form of this imitation is dramatic, or narrative, or mixed with both; the fable fimple; the manners not too polite nor too ruftic; the thoughts are plain, yet admit a little quicknefs and paffion, but that fhort and flowing; the expreffion humble, yet as pure as the language will afford; neat, but not florid; eafy, and yet lively. In fhort, the fable, manners, thoughts, and expreffions are full of the greateft fimplicity in nature.

The complete character of this poem confifts in fimplicity, brevity, and delicacy; the two firft of which render an eclogue natural, and the laft delightful.

If we would copy nature, it may be ufeful to take this idea along with us, that paftoral is an image of what they call the golden age. So that we are not to defcribe our fhepherds, as fhepherds at this day really are, but as they may be conceived then to have been, when the beft of men followed the employment. To carry this refemblance yet farther, it would not be amifs to give thefe fhepherds fome fkill in aftronomy, as far as it may be ufeful to that fort of life. And an air of piety to the gods fhould fhine through the poem, which fo vifibly appears in all the

the works of antiquity: and it ought to preferve fome relifh of the old way of writing; the connection fhould be loofe, the narrations and defcriptions fhort, and the periods concife. Yet it is not fufficient that the fentences only be brief, the whole eclogue fhould be fo too. For we cannot fuppofe poetry, in thofe days, to have been the bufinefs of men, but their recreation at vacant hours.

But with refpect to the prefent age, nothing more conduces to make thefe compofures natural, than when fome knowledge in rural affairs is difcovered. This may be made to appear rather done by chance than on defign, and fometimes is beft fhewn by inference; left, by too much ftudy to feem natural, we deftroy that eafy fimplicity from whence arifes the delight. For what is inviting, in this fort of poetry, proceeds not fo much from the idea of that bufinefs, as of the tranquillity of a country life.

We muft, therefore, ufe fome illufion to render a paftoral delightful; and this confifts in expofing the beft fide only of a fhepherd's life, and in concealing its miferies. Nor is it enough to introduce fhepherds difcourfing together in a natural way, but a regard muft be had to the fubject, that it contain fome particular beauty in itfelf, and that it be different in every eclogue. Befides, in each of them, a defigned fcene or profpect is to be prefented to our view, which fhould likewife have its variety. This variety is obtained, in a great degree, by frequent comparifons, drawn from the moft agreeable objects of the country; by interrogations to things inanimate; by beautiful digreffions, but thofe fhort; fometimes by infifting a little on circumftances; and laftly, by elegant turns on the words, which renders the numbers extremely fweet and pleafing. As for the numbers themfelves, though they are properly of the heroic meafure, they fhould be the fmootheft, the moft eafy, and flowing imaginable.

It is by rules, like thefe, we ought to judge a paftoral. And fince the inftructions given for any art are to be delivered as that art is in perfection, they muft, in neceffity, be derived from thofe in whom it is acknowledged fo to be. It is, therefore, from the practice of Theocritus and Virgil (the only undifputed authors of paftoral) that the critics have drawn the foregoing notions concerning it.

Theocritus excels all others in nature and fimplicity. The fubjects of his Idyllia are purely paftoral; but he is not fo exact in his perfons, having introduced reapers and fifhermen, as well as fhepherds. He is apt to be too long in his defcriptions, of which that of the cup, in the firft paftoral, is a remarkable inftance. In the manners he feems a little defective, for his fwains are fometimes abufive and immodeft, and, perhaps, too much inclining to rufticity; for inftance, in his fourth and fifth idyllia. But it is enough that all others learned their excellencies from him, and that his dialect alone has a fecret charm in it, which no other could ever attain.

Virgil, who copies Theocritus, refines upon his original; and in all points where judgment is principally concerned, he is much fuperior to his mafter. Tho' fome of his fubjects are not paftoral in themfelves, but only feem to be fuch, they have a wonderful variety in them, which the Greek was a ftranger to. He exceeds him in regularity and brevity, and falls fhort of him in nothing but fimplicity and propriety of ftyle; the firft of which, perhaps, was the fault of his age, and the laft of his language.

Among the moderns, their fuccefs has been greateft, who have moft endeavoured to make thefe antients their pattern. The moft confiderable genius appears in the famous Taffo and our Spenfer, Taffo, in his Aminto, has as far excelled all the paftoral writers, as in his Gierufalemme he has out-done the epic poets of his country. But as this piece feems to have been the original of a new fort of poem, the paftoral comedy in Italy, it cannot fo well be confidered as a copy of the antients. Spenfer's Calendar, in Mr. Dryden's opinion, is the moft complete work of this kind, which any nation has produced ever fince the time of Virgil. Not but that he may be thought imperfect in fome few points. His eclogues are fomewhat too long, if we compare them with the antients. He is, fometimes, too allegorical, and treats on matters of religion, in a paftoral ftyle, as the Mantuan had done before him. He has employed the lyric meafure, which is contrary to the practice of the old poets. His ftanza is not ftill the fame, nor always well chofen; this laft may be the reafon why his expreffion is fometimes not concife enough: for the tetraftic has obliged him to extend his fenfe to the length

length of four lines, which would have been more closely confined in the couplet. In the manners, thoughts, and characters, he comes near to Theocritus himself; though, notwithstanding all the care he has taken, he is certainly inferior in his dialect: for the doric had its beauty and propriety in the time of Theocritus; it was used in part of Greece, and frequent in the mouths of many of the greatest persons; whereas the old english and country phrases of Spenser were either entirely obsolete, or spoken only by people of the lowest condition. As there is a difference between simplicity and rusticity, so the expression of simple thoughts should be plain, but not clownish. The addition he has made of a calendar to his eclogues is very beautiful; since by this, besides the general moral of innocence and simplicity, which is common to other authors of pastoral, he has one peculiar to himself; he compares human life to the several seasons, and at once exposes to his readers a view of the great and little worlds, in their various changes and aspects. Yet the scrupulous division of the pastorals into months has obliged him either to repeat the same description in other words, for three months together; or, when it was exhausted before, entirely to omit it: whence it comes to pass, that some of his eclogues (as the 6th, 8th, and 10th, for example) have nothing but their titles to distinguish them. The reason is evident, because the year has not that variety in it to furnish every month with a particular description, as it may every season.

Pastoral staff, the same with crosier. See the article Crosier.

PASTRY, that branch of cookery, which is chiefly taken up in making pies, pasties, cakes, &c.

PASTURE, or Pasture-land, that reserved for feeding cattle.

Pasture-land is of such advantage to husbandry, that many prefer it even to corn-land, because of the small hazard and labour that attends it, and as it lays the foundation for most of the profit that is expected from the arable land, because of the manure the cattle afford which are fed upon it. Where dung is not to be bought, as is often the case in places distant from large towns, the farmer is forced to proportion his arable to his pasture-land, in such manner, that the cattle fed on the latter may be sufficient for a supply of dung, so necessary for producing the fruits of the former.

Pasture-lands are of three kinds: 1. The uplands: these lie so high as not to be overflowed by rivers, or land-floods. 2. Those low lands which lie near rivers and fens. And 3. Those that lie near the sea.

Pasture-land requires the refreshment of dung, as well as the arable or corn-land; but there is to be a difference made in the laying it on and spreading it. A harrow performs the office of spreading the dung on ploughed lands; but the best contrivance for pastures, is, to lay the dung in small heaps, and draw over it a gate stuck full of bushes. All dung that is laid on pasture-land, must be laid on in winter, that the rains may wash its fatness into the ground before the sun scorches it, or evaporates its goodness. Fine mould mixed with the dung, and spread with it over the land, is very good for pastures; for it is washed down to the very roots of the grass, and gives them a new and fine soil just in those places where it is most wanted.

The best manure for pasture-land is the rotten bottoms of old hay-stacks; for these moulder away into a very rich soil, and are always full of vast quantities of seed, fallen at times from the hay, which all grow when spread on the ground: and thus new nourishment, and a new set of plants are given at once to the exhausted ground. But as particularly useful as this is for pasture-ground, it is as improper for corn-land, and should by no means ever be suffered to mix with the manure for those grounds; as it will then raise grass and other plants, which tho' of use in the pasture are weeds among the corn.

Admeasurement of Pasture. See the article Admeasurement.

Pasture of plants, a term used by Tull, for the nourishment they draw from the earth. See the articles Plant and Vegetation.

PASTY, in cookery, a preparation of venison, veal, lamb, or other meat; which being well boned, beaten to a pulp, and highly seasoned, is inclosed in a proper paste, and baked in an oven.

PATAGONIA, the most southern part of south America, extending from the mouth of Rio di la Plata, in 36° of south lat. to Cape Horn, in 55° 30′.

PATAGONULA, or Patagonica, in botany, a genus of the pentandria-monogynia

gynia clafs of plants, with a monopetalous flower, that has fcarce any tube, and is divided into five oval and acute fegments: the fruit is an oval acuminated capfule, placed on a very large cup, with oblong emarginated fegments; which ftructure of the cup conftitutes the effential diftinction of the genus.

PATAI, a town of France, in the province of Orleanois, fourteen miles north of Orleans.

PATAN, the capital of a province in the Eaft Indies, fituated two hundred miles north of Huegly in Bengal: eaft long. 89°, north lat. 27° 30′.

PATAVINITY, *patavinitas*, among critics, denotes a peculiarity of Livy's diction, derived from Patavium, or Padua, the place of his nativity; but wherein this patavinity confifts, they are by no means agreed.

PATCHUCA, or PATIOQUE, a city of Mexico: weft long. 103°, north lat. 21°, fubject to Spain.

PATE, in fortification, a kind of platform, refembling what is called an horfe-fhoe; not always regular, but generally oval, encompaffed only with a parapet, and having nothing to flank it. It is ufually raifed in marfhy grounds, to cover the gate of a place.

PATE'E, or PATTE'E, in heraldry, a crofs fmall in the center, and widening to the extremes, which are very broad. See plate CXCIV. fig. 6. which is a crofs pattee, argent, upon a field fable.

PATELLA, in anatomy, a bone which covers the fore-part of the joint of the knee, called alfo rotula, and popularly the knee-pan. The patella is convex on the outfide, and on the infide unequal, having an eminence and two depreffions. Its fubftance is fpungeous, and confequently it is brittle; it is connected by tendons and ligaments to the tibia and the os femoris, which is the ligament by which it is connected to the thigh, and has a motion of afcent and defcent in the flexion of the tibia. In infants and children it is cartilaginous.

Fracture of the PATELLA. The patella, or knee-pan, is much more fubject to a tranfverfe fracture than to one in any other direction. The longitudinal fracture of this bone happens more rarely, but when it does, is much more eafily cured; becaufe the fragments of the bone, in this cafe, generally keep in their right places, but when the bone is broken not only tranfverfely, but into feveral pieces, the cafe is yet more difficult and dangerous. The cure of this fracture, according to Heifter, muft be attempted in this manner: in a longitudinal or perpendicular fracture, the patient muft be laid upon his back, and, extending the foot, the furgeon muft replace the fragments on both fides with the preffure of his hands, binding them up carefully with the uniting bandage; which muft be applied in this cafe in the fame manner with that ufed in large wounds in the belly or forehead. But when the patella is broken tranfverfely, or into feveral pieces, the patient being laid in the fame pofture, and extending his foot as before, the furgeon is with great care to endeavour with the palms of both his hands, affifted by his fingers and thumbs, to bring together and replace the fragments in their natural fituation; and when that is done, they muft be retained firmly together, by means of a plafter made in form of a half moon, or properly perforated, and then the foot and leg are to be bound up, and placed fo that they cannot be eafily moved: but to prevent the bone from being difplaced again, the patient muft not ufe his leg till after the ninth or tenth week. See the article FRACTURE.

PATELLA *luxated.* The patella is moft ufually luxated either on the internal or external fide of the joint, though phyficians give accounts of its being fometimes luxated both above and below it. Whenever the knee itfelf is perfectly luxated, the patella can fcarce avoid being difplaced at the fame time, becaufe of its ftrong connection to the thigh and to the tibia. See the article KNEE.

The reduction of a luxated patella is ufually no great difficulty. The patient is to be laid flat on his back upon a table or bed, or upon an even floor, fo that his leg may be pulled out ftraight by an affiftant; when this is fufficiently extended, the furgeon muft grafp the patella with his fingers, and afterwards, by the affiftance of his hand, prefs it ftrongly into its proper place. This may be alfo poffibly effected while the patient ftands upright: when this is done, there remains nothing but carefully to bind up the part, and let the patient reft for fome days; fometimes gently binding and extending his leg in the mean while, that it may not become ftiff.

PATELLA, the LIMPET, is a genus of fhell-fifh, with a fimple fhell, of a conic or other gibbofe figure, and a very wide opening

opening at the mouth or bottom; always applying itself firmly to some solid body, which serves it in the place of another shell: the animal inhabiting it is called limax. The summit of the limpet-shell is in some species acute, in others obtuse, and in some depressed, perforated, striated, fasciated, &c.

PATENT, in general, denotes something that stands open or expanded: thus a leaf is said to be patent when it stands almost at right angles with the stalk.

PATENT, or LETTERS-PATENT. See the article LETTER.

PATENT-GLOBES. See the article GLOBE.

PATENTEE, a person to whom the king has granted his letters-patent.

PATER PATRATUS, in roman antiquity, the principal person among the feciales or college of heralds. See the article FECIALES.

PATER NOSTER, the Lord's-prayer, so called from the two first words thereof in latin. It is also sometimes used for a chaplet or string of beads. And, in architecture, the same term is used for a sort of ornament cut in the form of beads, either oval or round, used on astragals, baguettes, &c.

PATER-NOSTRE'E, in heraldry, or a CROSS-PATERNOSTRE'E, is a cross made of beads.

PATERA, in roman antiquity, a goblet or vessel used by the Romans in their sacrifices; in which they offered their consecrated meats to the gods, and with which they made libations. The patera was of gold, silver, marble, brass, glass, or earth; and they used to inclose it in urns, with the ashes of the deceased, after it had served for the libations of wine and other liquors at the funeral. The patera is an ornament in architecture, frequently seen in the doric frieze, and in the tympans of arches.

PATERNITY, the quality of a father.

PATH, in general, denotes the course or tract marked out or run over, by a body in motion. See MOTION.

Concerning the path of a satellite, or secondary planet, on an immoveable plane, Mr. Maclaurin has demonstrated the following propositions.

Prop. I. The path of the satellite, on an immoveable plane, is the epicycloid that is described by a given point in the plane of a circle, which revolves on a circular base; having its center in the center of the sun, and its diameter in the same proportion to the diameter of the revolving circle, as the periodic time of the primary about the sun, to the time of the synodic revolution of the satellite about the primary: the tangent of the path is perpendicular to the right line that joins the satellite to the contact of the two circles; and the absolute velocity of the satellite is always as its distance from that contact.

Let T denote the periodic time of the primary about the sun, t the periodic time of the satellite about the primary. Let S (plate CXCV. fig. 1.) represent the sun, Aa the orbit of the primary: upon the radius AS, take AE to AS as t is to T. From the center S, describe the circle EeZ; and from the center A, the circle EMF. Let this circle EMF revolve on the other EeZ, as its base: then a point L, taken on the plane of the circle EMF, at the distance AL, equal to the distance of the satellite from the primary, shall describe the path of the satellite. For suppose the circle EMF to move into the situation emf, the point A to a, L to l; and let AL and al, produced, meet EMF and emf, in M and m. Upon the arc em take er = EM; then $\angle ear = \angle EAM$. Let ar meet the circle cld, described from the center a, with the distance al, in q; and because $\angle eaq = \angle EAL$, the angle eaq represents the elongation of the satellite from the sun at its first place L. Again, because $em (= er + rm) = e\mathrm{E} + \mathrm{EM}$, and $er = \mathrm{EM}$, it follows, that $rm = e\mathrm{E}$; and, consequently, $\angle ram : \angle e\mathrm{SE} :: \mathrm{SE} : \mathrm{AE} :: \mathrm{T} - t : t$; or, as the angular velocity of the satellite from the sun, to the angular velocity of the primary about the sun. But ESe is the angle described by the primary about the sun; consequently ram, or qal, is the simultaneous increment of the elongation of the satellite from the sun; l is its place when the primary comes to a; and the epicycloid, described by l, is the path of the satellite.

Because the circle EMF moves on the point E, the direction of the motion of any point L, is perpendicular to EL; or the tangent of the path, at any point L, is perpendicular to EL. The velocity of any point L, is as its distance EL; and the motion of the primary A being supposed uniform, and represented by EA, the velocity of the satellite shall be represented by EL.

Prop. II. Upon AS (*ibid.*) take AB : AS :: tt : TT (or AB : AE :: AE : AS); upon

upon the diameter E B defcribe the circle EK B, meeting E L in K; take L O a third proportional to L K and L E, on the fame fide of L with L K; and O fhall be the center of the curvature at L of the path, and L O the ray of curvature.

Becaufe E L and *e l* are perpendicular to the path at the points L and *l*, let them be produced, and their ultimate interfection O fhall be the center of curvature at L. Produce *q e* till it meet L E in V, join S V, and the angle S *e* V = *q e a* = L E A = S E V; confequently the angle *e* V E = *e* S E, the angle E V S = *e* S E, and the angle E V S = E *e* S, and S V is ultimately perpendicular to E O. Now the angle E O *e* is ultimately to E V *e* (= E S *e*) as E V to E O, that is (becaufe E V : E K :: E S : EB :: A S : AE) as E K × A S to E O × AE. But the angular motion of E L being equal to the angular motion of E A, while the circle E M F turns on the point E, L E *l* is therefore ultimately equal to A E *a*, which is to E S *e* as S A to A E; and E O *e* being to L E *l* as E L to L O, it follows that E O *e* : E S *e* :: S A × E L : A E × L O :: E K × S A : E O × A E. Therefore E L : L O :: E K : E O, and E L : L K :: LO : E L, or L K, L E and L O are in continued proportion. This theorem ferves for determining the ray of curvature of epicycloids and cycloids of all forts; only when the bafe E *e* is a right line, A B vanifhes, and E B becomes equal to E A.

Corol. I. When A L or A C is lefs than A B, then (becaufe L O is always on the fame fide of the point L with L K) the path is concave towards S throughout. When A C = A B, the curvature at the conjunction vanifhes, or the path has there a point of rectitude. When A C is greater than A B (or A S $\times \frac{tt}{TT}$), a portion of the path near the conjunction is convex towards S, becaufe a part of the circle CLD falls within the circle BKE; and when L comes to either of the interfections of thefe circles, the path hath a point of contrary flexure. If A C = A E, thefe points meet again, and form a cufp: and if A C $\sqsubset$ A E, the path hath a nodus; which laft is the cafe of the innermoft of the fatellites of jupiter and faturn.

Corol. II. In the cafe of the moon, *t t* : T T :: 1 : 178; and A B = $\frac{1}{178}$ × A S: but A C is about $\frac{1}{337}$ × A S; confequently, A C $\sqsupset$ A B, and the path of the moon is concave towards the fun throughout.

Prop. III. Let AB : A S :: *t t* : TT, and the force, by which the path of the fatellite can be defcribed on an immoveable plane, is always directed to the point B (*ibid.*) upon the ray A S, and is always meafured by B L, the diftance of the fatellite from the point B, the gravity of the primary towards the fun being reprefented by B A.

We conceive the force by which this path could be defcribed, on an immoveable plane, to be refolved into a force that acts in the direction L O, perpendicular to the path, but has no effect on the velocity of the fatellite; and a force perpendicular to L O, that accelerates or retards the motion of the fatellite. The former of thefe is meafured by L K, the latter by B K, the gravity of the primary towards the fun being meafured by A B. For the former is to the gravity of the primary towards S, as $\frac{EL^2}{LO}$ to $\frac{EA^2}{AS}$; (thofe forces being directly as the fquares of the velocities, and inverfely as the rays of curvature;) that is, as L K to A B, by prop. II. Therefore the gravity of the primary being reprefented by A B, the former force will be meafured by L K.

The fecond force that acts on the fatellite in the direction of the tangent of its path, and accelerates or retards its motion, is as the fluxion of the velocity E L directly, and the fluxion of the time inverfely. The fluxion of the time is meafured by $\frac{Aa}{EA}$ (A*a* being the arc defcribed by the primary, and E A the velocity with which it is defcribed) $= \frac{Ee}{EB} = \frac{rm}{EB} = \frac{lq \times AE}{EB \times AC} =$ (fuppofing *a n* and *q u* to be perpendiculars to *e l* in *n* and *u*, becaufe *l q* : *l u* :: *ac* : *a n*, or A C : A N) $\frac{AE \times lu}{BE \times AN} = \frac{lu}{BK}$. Therefore the force which is meafured by *l u*, the fluxion of the velocity E *l*, or E L, divided by the fluxion of time, or $\frac{lu}{BK}$, is meafured by B K. The force, therefore, in the direction L E being meafured by L K, and the force in the perpendicular

lar direction K B by K B, the compounded force is meafured by L B, and is directed from L to B.

It appears, from what has been demonftrated, that the path may be defcribed by a force directed towards the point B (which is given upon the ray A S, but revolves along with this ray about S) or by any forces which, compounded together, generate a force tending to B, and always proportionable to L B, the diftance of the fatellite from B. Let L H be equal and parallel to A B, and A B H L fhall be a parallelogram, and the force L B may be compounded of L H and L A; that is, the force L B may be the refult of a force L H acting on the fatellite, equal and parallel to A B, the gravity of the primary towards the fun, and of a force L A tending to the primary, and equal to the gravity by which the fatellite would defcribe the circle C L D about the primary, in the fame periodic time t, if the fun was away; becaufe fuch a force is to the gravity of the primary towards the fun (reprefented by A B) as $\frac{AL}{tt}$ to $\frac{AS}{TT}$ or as A L to $AS \times \frac{tt}{TT} = AB$.

Thus we arrive at the fame conclufion which Sir Ifaac Newton, more briefly, derived from an analyfis of the motions of the fatellite; that while the fatellite gravitates towards the primary, if, at the fame time, it be acted on by the fame folar force as the primary, and with a parallel direction, it will revolve about the primary, in the fame manner as if this laft was at reft, and there was no folar action. Thefe two forces, the gravitation towards the primary, and a force equal and parallel to the gravitation of the primary towards the fun, are exactly fufficient to account for the compounded motion of the fatellite in its path, however complex a curved line it may appear to be. Nor is there any perturbation of the fatellite's motion, but what arifes from the inequality of the gravity of the fatellite, and of the primary towards the fun, or from their not acting in parallel lines. If we fhould fuppofe them to move about their common center of gravity, while this is carried round the fun, or if we fuppofe the orbits to be elliptical, the conclufions will ftill be found confonant to what was more briefly deduced by this great author.

PATH *of the moon*, the tract defcribed by the moon, while the earth defcribes its annual orbit. See EARTH and MOON.

The ingenious Mr. Neale having invented machines for illuftrating this path of the moon, by means of which, the motion of that fecondary planet, fo difficult to be conceived by young ftudents in aftronomy, is rendered extremely eafy and familiar, we fhall here give the defcription of them. Fig. 2. plate CXCV. n° 1. reprefents the largeft of thefe machines, containing the motion of the moon from the full to the new, and from the new to the full; and as the entire annual motion of that planet is only a repetition of the former, the machine is of the fame utility as if it contained the whole path of the moon. A B reprefents part of the earth's annual orbit; D E F, part of that of the moon; T, the earth; M, the moon; $f G g$, the path defcribed by the index f; S, the fun; HL, a circle divided into $29\frac{1}{2}$ equal parts, the number of days in a mean lunation; K, an index which moves on the center I, and points out the age of the moon. The machine is put in motion by the winch N; and while the earth defcribes the part of its orbit A B, the moon defcribes the curve F E D, exhibiting her feveral phænomena, as full, laft quarter, new, firft quarter, &c. Thus, when the moon is moved to E, the earth will be in C, exhibiting not only the phænomena of a new moon, but alfo that of a folar eclipfe. In this pofition, the young ftudent will eafily apprehend the reafon why the moon is not vifible, unlefs there be an eclipfe of the fun, as the fun and moon are then in the fame right line, and only the dark part of the moon is turned towards the earth. By continuing the motion from thence to the full, the reafon why the moon appears partly dark and partly light, will be rendered very confpicuous; the light part of the moon, reprefented by the white part of the ball, gradually emerging from a cap as fhe moves from the new to the full. When the moon is at D or F, the earth will be at A or B, and exhibit the phænomena of a full moon and lunar eclipfe. In this pofition the whole white part of the ball will be turned without the cap and toward the fun; and therefore her whole face, which is turned towards the earth, will be illuminated, unlefs the fun's rays are intercepted by the earth, in which cafe there will be an eclipfe of the moon.

By

By caufing the moon to move from the full to the new, the reafon of her decreafe will be vifible, the white part of the ball gradually immerfing behind the cap, till fhe comes in oppofition to the fun, and exhibits the phænomenon of a new moon. There is fixed an index near the ftem of the moon, which fhews her apparent motion in the ecliptic during her revolution round the earth, which is performed in a lunar month. By the help of this machine, an idea of the motion of the moon, and the curve fhe defcribes, may be obtained in an eafy and entertaining manner. It will alfo appear evident, that her path is always concave towards the fun, notwithftanding her motion round the earth, an idea which, to beginners, has always been attended with difficulty.

N° 2. *ib.* reprefents another of thefe machines containing the moon's motion during one lunation, or from one new moon to another; where S, is the fun; A B, part of the earth's orbit; C, the moon; D, the earth; *a b*, a circle graduated into 29 ½ equal parts, the number of days in a mean lunar month; E, the index, fhewing the moon's age on the quadrated circle *a b*; F, a button by which the machine is put in motion.

N° 3. *ibid.* is another of thefe machines, reprefenting the whole annual path of the moon; S, the fun; D, the moon; E, the earth; ABC, the annual path of the moon; HIKL, the orbit of the earth; *a b*, a circle graduated into 29 ½, as in the other machines; F, the index fhewing the moon's age; G, a button, whereby the machine is moved. The explanation we have given of n° 1. will be fufficient for forming an idea of the other two.

PATH *of the vertex*, a term frequently ufed by Mr. Flamfteed, in his doctrine of the fphere, for a circle defcribed by any point of the earth's furface, as the earth turns round its axis: this point is confidered as vertical to the earth's center, and is the fame with the vertex or zenith in the ptolemaic projection.

The femi-diameter of this path is always equal to the fine of the complement of the latitude of the point that defcribes it.

PATHETIC, whatever relates to the paffions, or that is proper to excite or awake them. See the article STYLE.

In mufic, this term is ufed for fomething very moving, expreffive, or paffionate, and is capable of exciting pity, compaffion, anger, or the like. The chromatic genus, with its greater and leffer femitones, either afcending or defcending, is very proper for the pathetic; as is alfo an artful management of difcords, with a variety of motions now brifk, now languifhing, now fwift, now flow. Nieuwentyt mentions a mufician of Venice, who excelled in the pathetic to fuch a degree, as to be able to play his auditors into diftraction; he adds, that the great means he made ufe of, was the variety of his motions, &c.

PATHETIC NERVES, in anatomy, a pair of very fmall nerves which arife in the brain, and run to the trochlear mufcle of the eye. Thefe nerves have obtained the name pathetic, from their ferving to move the eyes in the various paffions.

PATHOGNOMONIC, παθογνωμονικός, among phyficians, an appellation for a fymptom, or concourfe of fymptoms, that are infeparable from a diftemper, and are found in that only, and in no other.

PATHOLOGY, that part of medicine, which explains the nature of difeafes, their caufes and fymptoms.

PATHOS, πάθος, a greek term, literally fignifying paffion, is fometimes ufed for the energy of a difcourfe, or its power to move the paffions.

PATIENT, among phyficians, a perfon under the direction of a phyfician or furgeon, in order to be cured of fome difeafe.

PATIENTIÆ MUSCULUS, in anatomy, the levator fcapulæ. See LEVATOR.

PATMOS, one of the leaft of the iflands of the Archipelago, fubject to the Turks: eaft long. 27°, and north lat. 37°.

PATNA, a city of the hither India, the capital of the territory of the fame name, in the province of Bengal; eaft longit. 85°, and north lat. 26°.

PATANCE, in heraldry, is a crofs flory at the ends; from which it differs only in this, that the ends inftead of turning down like a fleur de lis, are extended fomewhat in the pattee-form. See the article FLORY.

PATOWMAC, a great river of Virginia, which arifes in the Apalachian mountains, and after feparating Virginia from Maryland, falls into the bay of Chefepeak.

PATRANA, or PASTRANA, a town of Spain, in the province of New Caftile, forty miles eaft of Madrid.

PATRAS, a city and port-town of European

ropean Turky, in the province of the Morea: eaft long. 21° 30′, and north lat. 38° 20′.

PATRES CONSCRIPTI, CONSCRIPT FATHERS. See the articles CONSCRIPT and SENATOR.

PATRIARCHS, among Chriftians, are ecclefiaftical dignitaries, or bifhops, fo called from their paternal authority in the church. The power of patriarchs was not the fame in all, but differed according to the different cuftoms of countries, or the pleafures of kings and councils: thus the patriarch of Conftantinople grew to be a patriarch over the patriarchs of Ephefus and Cæfarea, and was called the œcumenical and univerfal patriarch; and the patriarch of Alexandria had fome prerogatives, which no other patriarch befides himfelf enjoyed, fuch as the right of confecrating and approving every fingle bifhop under his jurifdiction. The general privileges of the patriarchate were thefe following; 1. The patriarchs ordained all the metropolitans under them; but they themfelves were ordained by a diocefan fynod. 2. They had the power of convening all their metropolitans and provincial bifhops to a diocefan fynod. 3. They had the privilege of receiving appeals from metropolitans and provincial fynods, and of reverfing their decrees. 4. They might enquire into the adminiftration of metropolitans, and cenfure them in cafe of herefy or mifdemeanor. 5. A patriarch had power to fend a metropolitan into any part of his diocefe as his commiffioner, to hear and determine ecclefiaftical caufes in his name. 6. The metropolitans did nothing of moment without confulting the patriarchs. 7. It was the patriarch's office to publifh both ecclefiaftical and civil laws, fo far as concerned the church. 8. They were all co-ordinate, and independent of one another.

The title of patriarch is ftill kept up in the greek church, the fupreme head of which is the patriarch of Conftantinople; who pays fometimes ten, fometimes twenty thoufand crowns to the grand-feignor for his inftalment.

PATRIARCHAL CROSS, in heraldry, is that where the fhaft is twice croffed; the lower arms being longer than the upper ones. Plate CXCIV. fig. 7. is a patriarchal crofs, gules, on a field argent.

PATRICIAN, among the antient Romans, a title given to the defcendants of the hundred, or, according to others, of the two hundred firft fenators chofen by Romulus, and by him called patres, fathers.

Romulus, fays Kennet, as foon as his city was tolerably filled with inhabitants, made a diftinction of the people, according to honour and quality, giving the better fort the name of patres or patricii, and the reft the common title of plebeii. To bind the two degrees more firmly together, he recommended to the patricians fome of the plebeians, for them to protect and countenance; the former being ftyled patrons, and the laft clients. In difficult cafes, the patrons were always the counfellors of their clients, their advocates in judgments, and, in fhort, their advifers and overfeers in all affairs whatfoever. On the other hand, the clients faithfully ferved the patrons, not only paying them all imaginable refpect and deference; but, if occafion required, affifting them with money, towards defraying any extraordinary charges.

PATRIMONY, a right or eftate inherited by a perfon from his anceftors.

The term patrimony has been alfo given to church eftates or revenues, in which fenfe authors ftill fay, the patrimony of the church of Rimini, Milan, &c. The church of Rome had patrimonies in France, Africa, Sicily and many other countries. To create the greater refpect to the eftates belonging to the church, it was ufual to give their patrimonies the names of the faints they held in the higheft veneration: thus the eftate of the church of Ravenna was called the patrimony of St. Apollinarius; that of Milan, the patrimony of St. Ambrofe; and the Eftates of the roman church were called the patrimony of St. Peter in Abruzzo, the patrimony of St. Peter in Sicily, and the like.

What is now called St. Peter's patrimony is only the dutchy of Caftro, and the territory of Orvietto. See CASTRO, &c.

PATRINGTON, a market-town of Yorkfhire, fituated at the mouth of the Humber, fifty miles eaft of York.

PATRIPASSIANS, *patripaffiani*, in church-hiftory, a chriftian fect, who appeared about the latter end of the IId century; fo called from their afcribing the paffion to the Father: for they afferted the unity of God in fuch a manner as to deftroy all diftinction of perfons, and to make the Father and Son precifely the fame; in which they were followed by the fabellians,

fabellians, and others. The author and head of the patripaffians was Praxeas, a philofopher of Phrygia in Afia.

PATROL, in war, a round or march made by the guards, or watch, in the night-time, to obferve what paffes in the ftreets, and to fecure the peace and tranquillity of a city or camp. The patrol generally confifts of a body of five or fix men, detached from a body on guard, and commanded by a ferjeant.

PATRON, among the Romans, was an appellation given to a mafter who had freed his flave. As foon as the relation of mafter expired, that of patron began; for the Romans in giving the flaves their freedom, did not defpoil themfelves of all right and privileges in them; the law ftill fubjected them to confiderable fervices and duties towards their patrons, the neglect of which was very feverely punifhed.

Patron was alfo a name which the people of Rome gave to fome great man, under whofe protection they ufually put themfelves; paying him all kinds of honour and refpect, and denominating themfelves his clients; while the patron, on his fide, granted them his credit and protection.

PATRON, in the church of Rome, a faint, whofe name a perfon bears, or under whofe protection he is put, and whom he takes particular care to invoke: or a faint, in whofe name a church or order is founded.

PATRON, in the canon and common law, is a perfon, who having the advowfon of a parfonage, vicarage, or the like fpiritual promotion, belonging to his manor, hath, on that account, the gift and difpofition of the benefice, and may prefent to it whenever it becomes vacant. The patron's right of difpofing of a benefice, originally arifes either from the patron, or his anceftors, &c. being the founders or builders of the church; from their having given lands for the maintenance thereof; or, from the church's being built on their ground; and, frequently, from all three together.

PATRONAGE, the right of difpofing of a church or benefice, and enjoying feveral other privileges, fuch as having the honourable rights of the church being interred in the chancel, &c. See the article ADVOWSON and PATRON.

Arms of PATRONAGE, in heraldry, are thofe on the top of which are fome marks of fubjection and dependance: thus the city of Paris bears the fleurs de lis in chief, to fhew her fubjection to the king; and the cardinals, on the top of their arms, bear thofe of the pope, who gave them the hat, to fhew that they are his creatures.

PATRONYMIC, among grammarians, is applied to fuch names of men and women as are derived from thofe of parents or anceftors.

Patronymics are derived, 1. From the father, as Pelides, *i. e.* Achilles the fon of Peleus. 2. From the mother, as Philyrides, *i. e.* Chiron the fon of Philyra. 3. From the grandfather on the father's fide, as Æacides, *i. e.* Achilles the grandfon of Æacus. 4. From the grandfather by the mother's fide, as Atlantiades, *i. e.* Mercury the grandfon of Atlas. And, 5. From kings and founders of nations, as Romulidæ, *i. e.* the Romans from their founder king Romulus.

The termination of greek and latin patronymics are chiefly four, *viz. des*, of which we have examples above; *as*, as Thaumantias, *i. e.* Iris the daughter of Thaumas; *is*, as Atlantis, *i. e.* Electra the daughter of Atlas; and *ne*, as Nerine, the daughter of Nereus. Of thefe terminations *des* is mafculine; and *as*, *is*, and *ne*, feminine: *des* and *ne* are of the firft declenfion, *as* and *is* of the third.

PATTI, a port-town of Sicily, in the province of Val Demona, fituated on the Mediterranean, forty-fix miles weft of Meffina.

PAU, a city of France, in the province of Gafcony and territory of Bearne, fituated on the river Gave, thirty-fix miles fouth-eaft of Bayonne.

PAVAGE, in our old law-books, fignifies money paid towards paving the ftreets or highway.

PAVAN, a grave kind of dance, borrowed from the Spaniards, wherein the performers make a kind of wheel, or tail, before each other, like that of a peacock; whence the name.

PAVEMENT, a layer of ftone, or other matter, ferving to cover and ftrengthen the ground of divers places for the more commodious walking on.

In England the pavements of the grand ftreets, &c. are ufually of pebbles; courts, ftables, kitchens, halls, churches, &c. are paved ufually with tiles, bricks, flags, or fire ftones; and fometimes with a kind of free-ftone and rag-ftone. In

France the public roads, ſtreets, courts, &c. are paved with gres, a kind of free-ſtone. In Venice the ſtreets, &c. are paved with brick; churches ſometimes with marble, and ſometimes with moſaic work. In Amſterdam and the chief cities of Holland, they call their brick pavement the burger-maſters pavement, to diſtinguiſh it from the ſtone or flint pavement which is uſually in the middle of the ſtreet, ſerving for the paſſage of their horſes, carts, coaches, and other carriages; the brick-borders being deſigned for the paſſage of people on foot.

Pavements of free-ſtone, flints, and flags, in ſtreets, &c. are laid dry, that is, are retained in a bed of ſand; thoſe of courts, ſtables, ground-rooms, &c. are laid in mortar of lime and ſand, or in lime and cæment, eſpecially if there be vaults or cellars underneath: ſome maſons, after laying a floor dry, eſpecially of brick, ſpread a thin mortar over it, ſweeping it backwards and forwards, to fill up the joints. Thirty-two ſtatute bricks laid flat, pave a yard ſquare; ſixty-four of edge-wiſe. See the article Brick.

The ſquare tiles uſed in paving, called paving-bricks, are of various ſizes, from ſix to twelve inches ſquare. Pavements of churches, &c. frequently conſiſt of ſtones of different colours chiefly black and white; and of ſeveral forms, but chiefly ſquare and lozenges, artfully diſpoſed.

Pavement *of terrace*, is that which ſerves for the covering of a platform, whether it be over a vault, or on a wooden-floor. Thoſe over vaults are uſually ſtones ſquared, and bedded in lead. Thoſe on wood are either ſtones with beds, for bridges; tiles for ceilings in rooms; or lays of mortar, made of cæment and lime, with flints or bricks laid flat, as is ſtill practiſed by people in the eaſt and ſouth, on the tops of their houſes.

Moſaic Pavement. See Mosaic-work.

Teſſelated Pavement. See Tesselated.

PAVETTA, in botany, a genus of the tetrandria-monogynia claſs of plants, with a monopetalous funnel-faſhioned flower, and a monoſpermous berry for its fruit.

PAVIA, a city of Italy, in the dutchy of Milan, capital of the Paveſan, the ſee of a biſhop, and univerſity, ſituated in eaſt long. 9° 40′, and north lat. 45° 15′.

Pavia, in botany, a genus of the octandria-monogynia claſs of plants, the corolla whereof conſiſts of five roundiſh petals, the upper ones being longer than the reſt, and all of them inſerted into the cup by very long ungues; the fruit is coriaceous, turbinated, obtuſely tetragonal, made up of four valves, and containing four cells; the ſeeds are ſolitary and roundiſh.

PAVICULA, among the Romans, a rammer or inſtrument for beating down or levelling a ſpot of ground, conſiſting of a block of wood, a foot long, and half a foot thick, with a long handle.

PAVILION, in architecture, ſignifies a kind of turret or building, uſually inſulated, and contained under a ſingle roof; ſometimes ſquare, and ſometimes in form of a dome: thus called from the reſemblance of its roof to a tent.

Pavilions are ſometimes alſo projecting pieces, in the front of a building, marking the middle thereof; ſometimes the pavilion flanks a corner, in which caſe it is called an angular pavilion. The Louvre is flanked with four pavilions: the pavilions are uſually higher than the reſt of the building. There are pavilions built in gardens, commonly called ſummer-houſes, pleaſure houſes, &c. Some caſtles or forts conſiſt only of a ſingle pavilion.

Pavilion, in military affairs, ſignifies a tent raiſed on poſts, to lodge under in the ſummer time. See the article Tent.

Pavilion is alſo ſometimes applied to flags, colours, enſigns, ſtandards, banners, &c. See the articles Flag, &c.

Pavilion, in heraldry, denotes a covering in form of a tent, which inveſts or wraps up the armories of divers kings and ſovereigns, depending only on God and their ſword.

The pavilion conſiſts of two parts; the top which is the chapeau, or coronet; and the curtin, which makes the mantle. None but ſovereign monarchs, according to the french heralds, may bear the pavilion entire, and in all its parts. Thoſe who are elective, or have any dependance, ſay the heralds, muſt take off the head, and retain nothing but the curtains.

Pavilions, among jewellers, the underſides and corners of the brilliants, lying between the girdle and the collet.

St. PAUL *de Leon*, a port-town of France, in the province of Britany, ſituated at the entrance of the Engliſh channel, in weſt long. 4°, and north lat. 49°.

St. Paul, a town of France, in the province

vince of Dauphine, ſituated on the eaſt ſide of the river Rhone, twelve miles north of Orange.

St. PAUL is alſo a city of Braſil, in South America, in the province of St. Vincent, ſituated in weſt long. 50°, and ſouth lat. 23° 30′.

PAULIONISTS, in church-hiſtory, chriſtian heretics of the IIId century, diſciples of Paul Samoſatenſis, biſhop of Antioch, who denied Chriſt's divinity, maintaining that when we call him the Son of God, we do not thereby mean that he is really and truly God; but only that he was ſo perfect a man, and ſo ſuperior in virtue to all others, that he had this name given him by way of eminence. The paulioniſts continued to the Vth century, notwithſtanding the prohibition of the emperor Conſtantine the great, who forbad them and other heretics to hold public aſſemblies.

PAULICIANS, chriſtian heretics of the VIIth century, diſciples of one Conſtantine, a native of Armenia, and a favourer of the errors of Manes; who, as the name manichees was become odious to all nations, gave thoſe of his ſect the title of Paulicians, on pretence that they followed only the doctrine of St. Paul. One of their moſt deteſtable maxims was, not to give alms to the poor, that they might not contribute to the ſupport of creatures, who were the works of the bad god. See the article MANICHEES.

PAULLINIA, in botany, a genus of the octandria-digynia claſs of plants, the corolla whereof conſiſts of four oblong petals, of an obverſely oval figure, patent, and twice as large at the cup: the fruit is a large triquetrous capſule, formed of three valves, and containing three cells; the ſeeds are ſingle, and of an oval figure.

PAUNCH, PANTCH, or PANCH, on board a ſhip, are broad clouts, woven of thrums and ſinnets together, to ſave things from galling and fretting; therefore they are made faſt to the main and fore-yards for that purpoſe.

PAVO, in zoology. See PEACOCK.

PAVO, in aſtronomy, a ſouthern conſtellation, called the peacock.

PAUPER, in law. See the article FORMA PAUPERIS.

PAURAEDRASTYLÆ, in natural hiſtory, the name of a genus of perfect cryſtals, with double pyramids, and no intermediate column, compoſed of twelve planes, or two hexangular pyramids, joined baſe to baſe. See CRYSTAL.

PAUSANIA, in grecian antiquity, a feſtival, in which were ſolemn games, wherein nobody contended but free-born Spartans; in honour of Pauſanias, the ſpartan general, under whoſe conduct the Greeks overcame Mardonius, in the famous battle at Plateæ: there was always an oration in honour of Pauſanias.

PAUSARY, *pauſarius*, in roman antiquity, an officer, who, in the ſolemn pomps or proceſſions of the goddeſs Iſis, directed the ſtops or pauſes. In theſe ceremonies there were frequent ſtands at places prepared for the purpoſe, wherein the ſtatues of Iſis and Anubis were ſet down; much after the manner of the reſting-places in the proceſſion of the holy ſacrament, in the romiſh church: the reſt were called manſiones.

PAUSARY was alſo the name of an officer in the roman gallies, who gave the ſignal to the rowers, and marked the times and pauſes, to the end they might act in concert, and row all together: this was done with a muſical inſtrument.

PAUSE, a ſtop or ceſſation of ſpeaking, ſinging, playing, or the like. The uſe of pointing in grammar, is to make proper pauſes, in certain places. There is a pauſe in the middle of each verſe; in an hemiſtich it is called a reſt or repoſe. See the article REST.

PAUSE, in muſic, a character of ſilence, or reſt, called alſo by ſome a mute figure; becauſe it ſhews that ſome part or perſon is to be ſilent, while the reſt continue the ſong. Pauſes are uſed either for the ſake of ſome fugue or imitation, or to give a breathing time; or to give room for another voice, &c. to anſwer what this part ſung, as in dialogues, echoes, &c. General pauſe denotes a general ceſſation or ſilence of all the parts; and demi-pauſe, a ceſſation for the time of half a meaſure. They alſo ſay, pauſe of a minim, pauſe of a ſemibreve, long pauſe, pauſes of a croma and ſemicroma, being names given by the Italians, to expreſs the different values or duration of pauſes for the ſigns of which, ſee the article CHARACTER.

PAW, PATTE, in heraldry, the fore-foot of a beaſt, cut off ſhort. If the leg be cut off, it is called gambe. Lions paws are much uſed in armory.

PAW, in the manege. A horſe is ſaid to paw the ground, when his leg, being either

either tired or painful, he does not reſt it upon the ground, and fears to hurt himſelf as he walks.

PAWLE, in a ſhip, a ſmall piece of iron bolted to one end of the beams of the deck, cloſe to the capſtan; but yet ſo eaſily, as that it can turn about. Its uſe is to ſtop the capſtan from turning back, by being made to catch hold of the whelps: they therefore ſay, heave a pawle; that is, heave a little more, for the pawle to get hold of the whelps: and this they call pawling the capſtan.

PAWN, a pledge lodged for the ſecurity of the payment of a ſum of money borrowed. As the party that pawns the goods, has a general property therein, they cannot be forfeited by the perſon that hath them in pawn, for any offence of his; neither can they be taken in execution for his debt: on the other hand, where goods are repawned for money, if, after judgment is obtained againſt the pawner for debt, the goods in the pawnee's hands, are not liable to execution until ſuch time as the money lent be paid to the pawnee. He that borrows money on a pawn, is to have again the pledge, when he repays the ſame; or he may bring an action for detaining it; and his very tender of the money reveſts the ſpecial property in him. Likewiſe it has been held, that where a broker refuſes, on tendering the money, to redeliver the goods, he thereupon ſhall be indicted. In caſe goods are pawned for lent money, and no day fixed for their redemption, they are ſaid to be redeemable at any time during the pawner's life; and though they may not be redeemed after his death, they may after the death of the pawnee. Where the pawn is redeemable on a certain day, it muſt be ſtrictly obſerved, or upon failure of payment it may be ſold. Alſo it is the common practice of the brokers, when no day is fixed for redemption, not to ſtay longer than a year for their money, at the expiration of which time they uſually ſell the goods.

PAWN, among miners, a pledge put into the bar-maſter's hand, at the time when the plaintiff cauſes the bar-maſter to arreſt the mine.

PAWN-BROKER. See the article BROKER.

PAX, PEACE. See the article PEACE.

PAY, in the ſea-language. The ſeamen ſay, pay more cable, when they mean to let out more cable.

PAYING, among ſeamen. When the ſeams of a ſhip are laid over with a coat of hot pitch, it is called paying her; and when this is done with canvas, parcelling: alſo when, after ſhe is graved, and the ſoil burned off, a new coat of tallow and ſoap, or one of train-oil, roſin, and brimſtone boiled together, is put on her, that is alſo called paying of a ſhip.

PAYMENT, the diſcharge of a debt, either by money really told, or by bills of exchange, &c. See the article DEBT. The manner of payment ſhall be directed by him that pays the money, and not by the receiver of it. If money be paid before the time, it is, in law, accounted a payment at the day; and here the payment of a leſſer ſum may be a ſatisfaction for the whole, though not otherwiſe.

PAZ, a city of Peru in South America, ſituated on the eaſt ſide of the lake Titicaca: weſt long. 66°, and ſouth lat. 18°.

PEA, *piſum*, in botany. See PISUM.

PEACE, *pax*, in its general ſignification, ſtands in contradiſtinction to war.

Peace, in our law-books, ſignifies a quiet and inoffenſive behaviour towards the king and his people. It is obſerved, that all authority for keeping the peace comes originally from the king, who is the ſupreme officer or magiſtrate for the preſervation of it. Alſo the lord-chancellor and judges of the king's bench, &c. have a general power to keep the peace over all the realm; as have likewiſe all courts of record within their own precincts, and ſheriffs of counties, juſtices of the peace, conſtables, &c. No perſon may break the peace without being liable to puniſhment; and where any perſon is in danger of harm, or ſome bodily prejudice from another, on oath made thereof before a juſtice of the peace, or other magiſtrate, he may be ſecured by bond or recognizance, which is commonly called binding to the peace.

PEACE *of the king*, is that peace or ſecurity, both of life and goods, which the king promiſes to all his ſubjects, or others that are under his protection. There is alſo the peace of the king's highways, which is to be free from all annoyance and moleſtation; to which may be added the peace of the plough, whereby both the plough and ploughcattle are ſecured from diſtreſſes; and fairs are ſaid to have their peace, ſo that no perſon may be troubled there for debts contracted elſewhere.

PEACH, in botany. See PERSICA.

PEACOCK, *pavo*, in ornithology, a genus of birds, of the order of the gallinæ,

the

the characters of which are these: there are four toes on each foot, and the head is ornamented with an erect crest of feathers.

Of this genus there are several species, distinguished by their different colours. The male of the common kind is, perhaps, the most gaudy of all the bird-kind; the length and beauty of whose tail, and the various forms in which the creature carries it, are sufficiently known and admired.

PEACOCK-FISH, *pavo*, in ichthyology, a very beautiful species of labrus, with the pectoral fins round at the extremity, and so called from its beautiful variety of colours, as red, blue, yellow, brown, &c. It grows sometimes to more than three pounds in weight. See plate CXCIV. fig. 9.

PEAK, a rocky mountainous country in the west of Derbyshire, remarkable for its mines of lead and iron, &c.

PEAN, in heraldry, is when the field of a coat of arms is sable, and the powderings or.

PEAR, *pyrus*, in botany. See PYRUS.

PEARCH, in ichthyology, the same with perca. See the article PERCA.

PEARCH-FISHING. See FISHING.

PEARCH-GLUE, the name of a kind of glue of remarkable strength and purity, made from the skins of pearches. See the article GLUE.

PEARL, *margarita*, in natural history, a hard, white, shining body, usually roundish, found in a testaceous fish resembling an oyster.

Pearls, though esteemed of the number of gems of our jewellers, and highly valued, not only at this time, but in all ages, proceed only from a distemper in the creature that produces them, analogous to the bezoars, and other stony concretions in several animals of other kinds; and what the antients imagined to be a drop of dew concreted into a pearl in the body of the pearl-fish, which they supposed rose from the bottom to the surface of the water to receive it, is nothing more than the water destined to form and enlarge the shell, bursting from the vessels destined to carry it to the parts of the shell it should have formed, and by that means producing these little concretions.

The fish in which these are usually produced is the East-Indian pearl-oyster, as it is commonly, though not very properly, called; it has a very large and broad shell of the bivalve kind, sometimes measuring twelve or fourteen inches over, but those of eight inches are more frequent: it is not very deep; on the outside it is of a dusky brown, and within of a very beautiful white, with tinges of several other colours, as exposed in different directions to the light. Besides this shell, there are many others that are found to produce pearls; as the common oyster, the muscle, the pinna marina, and several others, the pearls of which are often very good, but those of the true indian berberi, or pearl-oyster, are in general superior to all. The small or seed-pearls, also called ounce pearls, from their being sold by the ounce, and not by tale, are vastly the most numerous and common; but as in diamonds, among the multitudes of small ones, there are smaller numbers of larger found, so in pearls there are larger and larger kinds; but as they increase in size, they are proportionably less frequent, and this is one reason of their great price. We have scotch pearls frequently as big as a little tare, some as big as a large pea, and some few of the size of a horse-bean; but these are usually of a bad shape, and of little value in proportion to their weight. Philip II. of Spain had a pearl perfect in its shape and colour, and of the size of a pigeon's egg. De Boot tells us of one in the emperor Rudolph's possession, of thirty carrats weight; Tavernier mentions one in Persia, for which that crown paid to the amount of more than a hundred thousand pounds sterling; and we are told of Cleopatra's possessing one worth fourscore thousand pounds of our money; pearls of such vast sizes as these, are as rare as the great diamonds; but, as among diamonds, there are a considerable number, which though very short of this, are of great value. The finest, and what is called the true shape of the pearl, is a perfect round; but if pearls of a conderable size are of the shape of a pear, as is not unfrequently the case, they are not less valued, as they serve for ear-rings and other ornaments. Their colour ought to be a pure white, and that not a dead and lifeless, but a clear and brilliant one; they must be perfectly free from any foulness, spot or stain, and their surfaces must be naturally smooth and glossy, for they bring their natural polish with them, which art is not able to improve.

All

All pearls are formed of the matter of the ſhell, and conſiſt of a number of coats ſpread with perfect regularity one over another, in the manner of the ſeveral coats of an onion, or like the ſeveral ſtrata of the ſtones found in the bladders or ſtomachs of animals, only much thinner. It is obſerved that the whiteſt pearls, brought into Europe, contract a yellowneſs on the ſurface, which no art can recover; but there is a way of taking off the whole outer coat of the pearl, in which caſe the ſecond ſurface, which is as bright as the originally external one, preſerves its beauty for a long time. This, however, is a very nice operation to perform, and at beſt greatly diminiſhes the value of the pearl by taking from its ſize and weight. It is ſaid that thoſe pearls which have ſomewhat of a yellowiſh caſt never alter, nor ever loſe their luſtre; and if this be true, the antients, who preferred thoſe which were a little yellowiſh to the perfectly white ones, had great reaſon on their ſide.

The little protuberances, like warts, which we ſee riſing in hemiſpherical figures from the ſurfaces of ſhells, are evidently of the pearl-kind, only not detached: when theſe are of a good colour, and tolerably large, our workmen cut them out, and make ſomething of them under the name of wens of pearls. This valuable article of commerce is not the product of any peculiar part of the world. The Eaſt-Indies and America produce the pearl ſhell-fiſh in abundance, and it is found with good pearls in many parts of Europe. The coaſts of the iſland Ceylon afford pearls ſuperior to thoſe of all the Eaſt in the beauty of their colour, but there are no very large ones found there. The Perſian gulph abounds with the pearl-fiſh, and fiſheries are eſtabliſhed on the coaſts of the ſeveral iſlands in it. In America, there are fiſheries in the gulph of Mexico, and along the coaſt of Terra Firma, all which yield conſiderable advantage. The european pearls are principally found on the coaſts of Scotland, and the neighbouring parts.

The pearls met with in apothecaries ſhops are of various kinds, all that are unfit for the jewellers purpoſes coming thither; conſequently ſome of the rough and ill ſhaped pearls, and thoſe of bad colours, are at times to be met with there; though the generality are what are only too ſmall for working into toys, &c. Theſe, after levigation, make an impalpable powder, which is much talked of as an ingredient in what is called pearl-cordials; but moſt of the apothecaries uſe only levigated oyſter-ſhell under its name. Great praiſes have, indeed, been given to pearls as cordials and ſudorifics; but without any great foundation: for they ſeem mere alkaline abſorbents, and as good as crabs-eyes, or oyſter-ſhells, but not better.

Diamonds, pearls, rubies, and all other jewels, are imported duty free, only levigated or beaten pearls pay, on importation, 7¼d. the ounce troy; and draw back, on exportation, 6$\frac{80}{100}$d.

Manner of fiſhing for PEARLS *in the Eaſt-Indies.* There are two ſeaſons for pearl-fiſhing, the firſt is in March and April, and the laſt in Auguſt and September; and the more rain there falls in the year, the more plentiful are theſe fiſheries. At the beginning of the ſeaſon there are ſometimes two hundred and fifty barks on the banks; the larger barks having two divers, and the ſmaller one. Each bark puts off from ſhore at ſun-riſe, with a land-breeze, which never fails; and returns again by a ſea-breeze, which ſucceeds it about noon. As ſoon as the barks arrive at the place where the fiſh lie, and have caſt anchor, each diver binds a ſtone ſix inches thick, and a foot long, under his body; which ſerves him as ballaſt, prevents his being driven away by the motion of the water, and enables him to walk more ſteadily under the waves. They alſo tie another very heavy ſtone to one foot, by which they are very ſpeedily ſent to the bottom of the ſea: and as the oyſters are uſually firmly faſtened to the rocks, they arm their hands with leather-mittens to prevent their being wounded in pulling them violently off; but this taſk ſome perform with an iron-rake. In the laſt place, each diver carries down with him a large net in the manner of a ſack, tied to his neck by a long cord, the other end of which is faſtened to the ſide of the bark. This net is to hold the oyſters gathered from the rock, and the cord is to pull up the diver when his bag is full, or he wants air. See DIVING.

In this equipage he ſometimes precipitates himſelf ſixty feet under water; and as he has no time to loſe, he no ſooner arrives at the bottom, than he begins to run from ſide to ſide tearing up all the oyſters he meets with, and cramming them into his budget.

At

At whatever depth the divers are, the light is so great, that they easily see whatever passes in the sea: and to their great consternation sometimes perceive monstrous fishes, from which all their address in mudding the water, &c. will not always save them, but they unhappily become their prey: and of all the dangers of the fishery, this is one of the greatest and most usual. The best divers will keep under water near half an hour, and the rest do not stay less than a quarter. During this time they hold their breath without the use of oils, or any other liquors; only acquiring the habit by long practice. When they find themselves streightened they pull the rope to which the bag is fastened, and hold fast by it with both hands; when those in the bark, taking the signal, heave them up into the air, and unload them of their fish, which is sometimes five hundred oysters, and sometimes not above fifty. Some of the divers need a moment's respite to recover breath; others jump in again instantly, continuing this violent exercise without intermission for several hours.

On the shore they unload their barks, and lay their oysters in an infinite number of little pits dug in the sand four or five feet square; raising heaps of sand over them to the height of a man; and in this condition they are left, till the rain, wind, and sun have obliged them to open, which soon kills them: upon this the flesh rots and dries, and the pearls, thus disengaged, fall into the pit, on their taking out the shells. After clearing the pits of the grosser filth, they sift the sand several times in order to find the pearls: but whatever care they take, they always lose a great many. After cleaning and drying the pearls, they are passed through a kind of sieve, according to their sizes: the smallest are then sold as seed-pearls, and the rest put up to auction, and sold to the highest bidder.

Artificial PEARLS, are made by reducing seed pearls to a paste, by means of a chemical preparation called mercurial water, making the beads in silver-moulds, boring them with a hog's bristle, and drying them in a closed glass in the sun.

Beads, in imitation of pearls, are also made of wax, and covered with the scales of several kinds of fishes.

Mother of PEARL, is the shell not of the pearl-oyster, but of another sea-fish of the oyster-kind. This shell on the inside is extremely smooth, and of the whiteness and water of pearl itself; and it has the same lustre on the outside, after the first laminæ or scales have been cleared off with aquafortis, and the lapidaries mill. Mother of pearl is used in inlaid-works, and in several toys, as snuff-boxes, &c.

PEARL, in heraldry, in blazoning with precious stones, is the same with argent, or white.

PEARL, PIN, or WEB, in medicine, an excrescence growing in the eye. See the article UNGUIS.

PEARL-FISH, *rhombus*. See RHOMBUS.

PEARL-FORT, a fortress in dutch Brabant, situated on the river Scheld, four miles north-west of Antwerp.

PEARL-ISLANDS, several small islands situated in the bay of Panama: west long. 81°, and between 7° and 9° of north lat.

PEAT, a kind of turf used for fuel in several countries. See the article MOSS. In Holland they have a way of charring peat, so that it may serve for fuel in several chemical operations; but this manner of charring is not yet known in several countries where, perhaps, peat might be found.

PEBBLES, the name of a genus of fossils, distinguished from the flints and homochroa, by their having a variety of colours. These are defined to be stones, composed of a crystalline matter, debased by earths of various kinds in the same species, and then subject to veins, clouds, and other variegations; usually formed by incrustations round a central nucleus, but sometimes the effect of a simple concretion, and veined like the agates, by the disposition the motion of the fluid they were formed in gave their differently coloured substances. Dr. Hill observes, that the variety of pebbles, were it of England alone, is so great, that a hasty describer would be apt to make almost as many species as he saw specimens. A careful examination will teach us, however, to distinguish them into a certain number of essentially different species, to which all the rest may be referred, as accidental variations. When we find the same substances and the same colours, or those resulting from a mixture of the same, such as nature frequently makes in a number of stones, we shall easily be able to determine, that these are all of the same species, though in different appearances; and that whether matter be disposed in one or two, or in

in twenty crufts, laid regularly round a central nucleus, or thrown without a nucleus into irregular lines, or finally, blended into a fort of uniform mafs.

Thefe are the three ftates in which we are liable to find every fpecies of pebble; for if it have been moft naturally and regularly formed by incruftation round a central nucleus, we find that ever the fame in the fame fpecies, and the crufts not lefs regular and certain. If the whole have been more haftily formed, and have been the refult only of one fimple concretion, if that has happened while its different fubftances were all moift and thin, they have blended together and made a mixed mafs of the joint-colour of them all; but if they have been fomething harder when this has happened, and too far concreted to diffufe wholly among one another, they are found thrown together in irregular veins. Thefe are the natural differences of all the pebbles; and having regard to thefe in the feveral variegations, all the known pebbles may be reduced to thirty-four fpecies; for an account of each, we refer the curious to Hill's hiftory of foffils, p. 512, feq.

There are many people of opinion, that the fwallowing of pebbles is very beneficial to health, in helping the ftomach to digeft its food; and a pebble-poffet is an old woman's medicine in the cholic in many parts of England. They ufually order the fmall white ftones to be picked up out of gravel-walks for this purpofe, and eat them in large quantities in fome fort of fpoon-meat, of which milk is an ingredient: however this cuftom may ftill prevail, we have no phyfician's practice to warrant it, and could produce inftances of much mifchief refulting from fwallowing of pebbles; a markable one whereof the reader may find recorded in the philofophical tranfactions, n° 253.

PECCANT, in medicine, a term ufed for thofe humours of the body which offend either by their quantity or quality.

PECK, a meafure of capacity, four of which make a bufhel. See the articles MEASURE and BUSHEL.

PECORA, in natural hiftory, a clafs of quadrupeds, the characters of which are, that they have no foreteeth in the upper-jaw; thofe in the lower are fix, or eight; the feet are covered with divided hoofs; and the teats are two, and are fituated in the groin.

To this clafs of animals belong the dromedary, the camel, the mofchus, the cervus or ftag, the capra or goat, the fheep, the ox, &c.

PECQUENCOUR, a town of the french Netherlands, in the province of Hainalt, five miles eaft of Doway.

PECTEN, a genus of bivalve fhells, fhutting clofe all round, and ufually of a depreffed form; but it is always aurited, or having one or two proceffes, called ears, iffuing from the head of the fhell near the hinge.

The greater part of the pectens are ftriated, or coftated; the ribs or ridges running in ftraight lines like the teeth of a comb; whence the name.

There are a great many elegant fpecies of this genus; as the ducal mantle-fhell, or pecten variegated with red and yellow, and a few ribs; the irifh fcallop-fhell, or red pecten variegated with white, &c.

PECTORAL, an epithet for medicines good for diforders of the breaft and lungs. The ordinary intentions of thefe medicines is either to attenuate or thicken the humours of thefe parts, and to render them fit to be expectorated or fpit out. See the article EXPECTORANTS.

The pectoral decoction, as altered by the college of phyficians, is as follows: take barley, raifins ftoned, figs, of each two ounces; of liquorice-root, half an ounce; of water, two quarts. Boil the water firft with the barley, then add the raifins, and afterwards, toward the latter end of the decoction, the figs and liquorice; the decoction is fully ended when one quart only of liquor is left after ftraining.

PECTORALIS, in anatomy, a pair of mufcles which poffeffes almoft all the whole breaft, and ferves to move the arm forwards. This mufcle has its origin in the clavicle, the fternum, and all the true ribs, and its termination at four fingers breadth below the head of the humerus. Its action is probably much affifted by the action of the coraco brachialis, and that of the deltoides by that of the upper part of this pectoral mufcle, which is ufually a kind of diftinct mufcle. Naturalifts obferve a fingular mark of providence, in the fize and ftrength of the pectoral mufcle in different animals. It is by the action of this mufcle, that the flying of birds is chiefly performed; and therefore much larger and ftronger in birds, than in any animals not made for flight.

PECTORIS os, in anatomy. See the article STERNUM.

PECULATE, in civil law, the crime of imbezzling the public money, by a person intrusted with the receipt, management, or custody thereof.

This term is also used by civilians for a theft, whether the thing be public, fiscal, sacred, or religious.

PECULIAR, in the canon law, signifies a particular parish or church that has jurisdiction within itself for granting probates of wills, and administrations, exempt from the ordinary or bishop's courts. The king's chapel is a royal peculiar, exempt from all spiritual jurisdiction, and reserved to the visitation and immediate government of the king himself. There is likewise the archbishop's peculiar; for it is an antient privilege of the see of Canterbury, that wherever any manors or advowsons belong to it, they forthwith become exempt from the ordinary, and are reputed peculiars: there are fifty-seven such peculiars in the see of Canterbury.

Besides these, there are some peculiars belonging to deans, chapters, and prebendaries, which are only exempted from the jurisdiction of the archdeacon: these are derived from the bishop, who may visit them, and to whom there lies an appeal.

Court of PECULIARS, is a court in which the affairs belonging to peculiars are transacted.

PECULIUM, the stock or estate which a person, in the power of another, as a slave, may acquire by his industry.

In the romish church, peculium denotes the goods which each religious reserves and possesses to himself.

PECUNIA, MONEY. See MONEY.

In our old law books pecunia denotes an estate in goods and chattels, as well as in money.

PECUNIARY, a term applied to the punishment of offenders by mulct or fine.

PEDAGOGUE, or PÆDAGOGUE, παιδαγωγος, a tutor or master, to whom is committed the discipline, and direction of a scholar, to be instructed in grammar and other arts.

PEDALS, the largest pipes of an organ, so called because played and stopped with the foot. The pedals are made square, and of wood; they are usually thirteen in number. They are of modern invention, and serve to carry the sounds an octave deeper than the rest. See ORGAN.

PEDANEUS, in the civil law, a petty judge who has no formal seat of justice, but hears causes standing, and without any tribunal. The pedanei were established in the see of every province, by the emperor Zeno: and Justinian erected seven of them at Constantinople, in manner of an office, granting them power to judge in any sum as high as three hundred crowns.

PEDANT, is used for a rough unpolished man of letters, who makes an impertinent use of the sciences, and abounds in unseasonable criticisms and observations. Dacier defines a pedant, a person who has more reading than good sense; and Malebranche describes him, as a man full of false erudition, who makes a parade of his knowledge, and is ever quoting some greek or latin author, or hunting back to a remote etymology: hence,

PEDANTRY, the quality or manner of a pedant.

PEDARIAN, in roman antiquity, those senators who signified their votes by their feet, not their tongues; that is, such as walked over to the side of those whose opinion they approved of, in divisions of the house. See the article SENATE.

PEDENA, or PENDENA, a town of Istria in the territory of Venice, situated twenty-eight miles south east of Cabo de Istria.

PEDESTAL, in architecture, the lowest part of an order of columns, being that which sustains the column, and serves it as a foot or stand. See COLUMN.

The pedestal consists of three principal parts, *viz.* a square, trunk, or dye, which makes the body; a corniche, the head; and a base, the foot of the pedestal. The pedestal is properly an appendage to a column, not an essential part of it; though M. Le Clerc thinks it essential to a complete order.

There are as many kinds of pedestals as there are of orders of columns, *viz.* the tuscan, doric, ionic, corinthian, and composite: some say that the height of the pedestal in each order, ought to be a third part of the whole column, comprehending the base and capital, and their proper adjuncts, as architrave, frieze, and corniche, a fourth part of the same pillar. Indeed Vignola, and most of the moderns, make the pedestal and all its ornaments in all the orders one third of the height of the column, including the base and capital; but some deviate from this rule. See the article BASE, &c.

The whole height of the tuscan column, comprehending the architrave, frieze and corniche, being divided into nine parts, two of these, according to Vitruvius, go to the height of the pedestal; which is by him described in two different forms, one of which is plain, having only a plinth for the base, and another for the capital: the height of each of these plinths is one-sixth of the whole height of the pedestal, and the projecture of these plinths is one-sixth of their height. In the pedestal that he describes of the other form, he also divides the whole height of the pedestal into six parts, one of which goes to the base, and one to the capital. Palladio and Scamozzi make the tuscan pedestal three modules high, Vignola five. See TUSCAN.

For the proportions of the doric pedestal, see the article DORIC.

And for the proportions of the ionic pedestal, see the article IONIC.

The corinthian pedestal is the richest and most delicate of all. The proportions of this pedestal are also given already under the article CORINTHIAN ORDER.

Vitruvius divides the whole height of the composite column into thirteen parts, making the height of the pedestal three of those parts. Vignola makes the composite pedestal of the same height with the corinthian, *viz.* seven modules; Scamozzi, six modules two minutes; Palladio, six modules seven minutes; in the goldsmith's arch, seven modules eight minutes. Its members in Vignola are the same with those of the corinthian, but with this difference, that whereas these are most of them enriched with carvings in the corinthian, they are all plain in the composite, and there is also a difference in the profiles of the base and corniche in the two orders. Daviler observes, that the generality of architects use tables or pannels, either in relievo or creux in the dyes of pedestals, without any regard to the character of the order: those in relievo he observes are only suitable to the tuscan and doric; the three others must be indented, which he says is a thing the antients never practised, as being contrary to the rules of solidity and strength.

Pedestals acquire other denominations, as those following: 1. Square pedestal, is that whose height and width are equal, as that of the arch of the lions at Verona, of the corinthian order; and such some followers of Vitruvius, as Serlio, Philander, &c. have given to their tuscan orders. 2. Double pedestal, is that which supports two columns, and has more breadth than height. 3. Continued pedestal, is one which supports a row of columns without any break or interruption, as those which sustain the fluted columns of the palace of the Tuilleries, on the garden-side.

PEDESTALS *of statues*, are such as serve to support statues or figures. Vignola observes, that there is no part of architecture more arbitrary, and in which more liberty may be taken, than in the pedestals of statues; there being no rules or laws prescribed by antiquity, nor any settled even by the moderns. There being then no settled proportion for these pedestals, the height depends on the situation, and the figure that they sustain: when on the ground, the pedestal is usually two thirds or two fifths of that of the statue; the more massive the statue is the stronger the pedestal must be. Their form and character, &c. are to be extraordinary and ingenious, far from the regularity and simplicity of the pedestals of columns. The same author gives a multiplicity of forms, as oval, triangular, multangular, &c.

PEDIÆUS, in anatomy, the second of the extensor muscles of the foot, having its origin in the lower part of the perone and annular ligament; and being divided into four tendons, which are inserted into the external part of the first articulation of the four toes. Its use is to extend the foot, together with the first of the extensors, called the extensor communis.

PEDICLE, among botanists, that part of a stalk which immediately sustains the leaf of a flower or a fruit, and is commonly called a foot-stalk.

PEDICULARIS, RED RATTLE, or LOUSE-WORT, in botany, a genus of the didynamia-angiospermia class of plants, the corolla whereof consists of a single ringent petal; the tube is oblong and gibbous; the upper lip galeated, erect, compressed, and emarginated; the under one is patent, plane, semitrifid, and obtuse; the fruit is a roundish, acuminated capsule; the seeds are numerous, roundish, compressed and covered. This plant is of a cooling and drying nature, whence it is recommended in fistulas and other sinous ulcers. It also

also stops hæmorrhages and the menses.

PEDICULARIS MORBUS, the same with phthiriasis. See PHTHIRIASIS.

PEDICULUS, LOUSE, in zoology, a genus of insects, the body of which is lobated at the sides; the legs are six, serving only for walking; and the eyes are two, and are simple.

Most animals are infested with lice, or insects which feed upon them: thus sheep have one species, oxen another, &c. and mankind are not free from them; for besides the common kind, whose natural habitation is in the heads of children, there is another kind called the crab-louse, whose natural residence is about the pubes. Authors also reckon the death-watch among the number of lice.

PEDILUVIUM, a bathing of the feet. This bath may be prepared of the same ingredients with other baths. It may either consist of light, pure water alone; or, to correct the qualities of heavy and hard water, a lixivium or bran of wheat or chamomile-flowers may be added.

Pediluvium is highly expedient for the purposes of derivation in those diseases which arise from the congestions of the humours to the head and breast, produced by spasms of the inferior parts, and especially of the hypochondria. Among this kind, besides lethargic diseases, we may reckon almost all disorders of the head, such as madness, melancholy, cephalæas, hemicranias, the clavus hystericus, vertigo's, toothachs, pains of the ears, a gutta rosacea; inflammations and defluxions of saline humours on the eyes, immoderate hæmorrhages from the nose, and long watchings. Of this kind are also some disorders which affect the breast, such as convulsive asthmas, dyspnœas arising from a plethora, palpitations of the heart, dry coughs, and spittings of blood. Besides, baths for the feet in consequence of their singular efficacy in relaxing spasms, are highly beneficial in spasmodic and convulsive disorders, in pains, cardialgias, colics, especially of the hæmorrhoidal kind, gripes produced by the stone, and inflations of the stomach.

It is to be observed, that pediluvium produces more happy effects, if before it is used the quantity of blood is lessened by venesection in the feet: it should be used about bed-time; and the feet kept warm till the patient goes to bed, by which means perspiration all over the body is increased.

PEDIGREE. See the article DESCENT.

PEDIMENT, in architecture, is a kind of low pinnacle, serving to crown an ordonnance, or finish a frontispiece, and is placed as an ornament over gates, doors, windows, niches, altars, &c. being ordinarily of a triangular form, but sometimes forming an arch of a circle. The parts of a pediment are the tympanum and the corniche, which crowns it, and the entablature, which serves it as a base, or scale. Architects have taken a great deal of liberty in the form of this member; nor do they vary less as to the proportion of the pediment. The most beautiful, according to Daviler, is that where its height is about one fifth of the length of its base.

The pediment is usually triangular, and sometimes an equilateral triangle, called also a pointed pediment; it is sometimes circular, though M. Felibien observes, that we have no instance of round pediments in the antique, besides those in the chapels of the rotundo. Sometimes its upper corniche is divided into three or four sides, or right lines: sometimes the corniche is cut or open a-top, which is an abuse introduced by the moderns, particularly Michael Angelo; for the design of this part over doors, windows, &c. being chiefly to shelter those underneath from the rain, to leave it open in the middle is to frustrate its end. Sometimes the pediment is formed of a couple of scrolls or wreaths like two consoles joined together; sometimes again it is without a base, or its lower corniche is cut out, all but what is bestowed on two columns or pilasters, and on these is raised an arch or sweep, instead of an entablature, of which Serlio gives an instance in the antique in a corinthian gate at Foligny, in Umbria; and Daviler a modern one in the church of St. Peter at Rome.

Under this kind of pediments come those little arched corniches, which form pediments over doors and windows, supported by two consoles, instead either of entablature or columns.

Sometimes the pediment is made double, *i. e.* a less pediment is made in the tympanum of a larger, on account of some projecture in the middle, as the frontispiece of the church of the great Jesus at Rome; but this is accounted an abuse in architecture, though authorised by very good buildings, as the large pavilion of the louvre, where the cary-

atides

atides support three pediments, one in another: sometimes the tympanum of the pediment is cut out, or left open to let in light, as is seen under the portico of the capitol at Rome; lastly, this open pediment is sometimes triangular, and enriched with sculpture, as roses, leaves, *&c.* as is found in most of the gothic churches.

M. Le Clerc observes, that the modillions in the corniche of the pediment should always answer exactly over those of the entablature. Indeed Vitruvius says, that the antients did not allow of any modillions at all in pediments. M. Le Clerc also observes, that the corniche which serves the pediment as a base, should have no cymatium, by reason the cymatium of the rest of the entablature, when it meets the pediment, passes over it. This change of determination occasions a considerable difficulty; the cymatium in this case appearing too broad in the turn of the angle, to remedy which, architects have recourse to several expedients. A pointed pediment may crown three arches, but a circular pediment can only crown agreeably. There should never be used more than two tympana over each other in the same frontispiece, and even where there are two, it would be proper to have the lower circular, and the upper pointed.

PEDIR, a town in the island of Sumatra, in the East-Indies, situated in east long. 94° lat. 5°.

PEDOMETER, or PODOMETER, the same with perambulator. See the article PERAMBULATOR.

PEDRERO, PETERERO, or PATERERO, a small piece of ordnance, used on board ships, for the discharging of nails, broken iron, or partridge shot, on an enemy attempting to board. See ORDNANCE. They are generally open at the breech, and their chamber made to take out, to be loaded that way, instead of at the muzzle.

PEDUNCLE, among botanists, the same with pedicle. See the article PEDICLE.

PEDUNCULI CEREBELLI, in anatomy, three medullary processes of the cerebellum, whereby that part is joined to the medulla oblongata. See the article CEREBELLUM.

The first of these processes ascends from the cerebellum towards the testes, and forms what is called the valvula magna of the brain; the second forms the annular prominence of Willis; and the third descends to the spinal marrow.

PEE, in mining, is used for the place where two veins meet and cross one another.

PEEBLES, or PEBLIS, a town of Scotland, capital of the shire of Tweedale, situated on the river Tweed, twenty-two miles south of Edinburgh.

PEEK, in the sea-language, is a word used in various senses. Thus the anchor is said to be a-peek, when the ship being about to weigh comes over her anchor in such a manner that the cable hangs perpendicularly betwixt the hause and the anchor. To heave a-peek is to bring the peek so as that the anchor may hang a-peek. A ship is said to ride a-peek, when lying with her main and fore-yards hoisted up, one end of her yards is brought down to the shrouds, and the other raised up an end; which is chiefly done when she lies in rivers, lest other ships falling foul of the yards should break them. Riding a-broad peek, denotes much the same, excepting that the yards are only raised to half the height.

Peek is also used for a room in the hold, extending from the bitts forward to the stem: in this room men of war keep their powder, and merchant-men their victuals.

PEER, in general, signifies an equal, or one of the same rank and station: hence in the acts of some councils we find, these words, with the consent of our peers, bishops, abbots, *&c.* Afterwards the same term was applied to the vassals or tenants of the same lord, who were called peers, because they were all equal in condition, and obliged to serve and attend him in his courts; and peers in fiefs, because they all held fiefs of the same lord. The term peers is now applied to those who are impannelled in an inquest upon a person for convicting or acquitting him of any offence laid to his charge; and the reason why the jury is so called, is, because by the common law, and the custom of this kingdom, every person is to be tried by his peers or equals, a lord by the lords, and a commoner by commoners. See the article JURY.

PEER *of the realm*, a noble lord who has a seat and vote in the house of lords, which is also called the house of peers. These lords are called peers, because, though there is a distinction of degrees in our nobility, yet in public actions they are

are equal, as in their votes in parliament, and in trying any nobleman, or other person impeached by the commons, &c. See the article PARLIAMENT.

All the peers who have a right to sit and vote in parliament, are to be summoned at least twenty days before the trial of a peer, indicted for treason or felony: the method of proceeding in which, is, after the indictment is found, the king, by commission under the great seal, appoints one of the peers, and generally the lord chancellor, to be lord high steward, who in these cases sits as judge. In order to bring the indictment before him, a certiorari is issued out of the court of chancery; and another writ also issues for bringing up the prisoner, a precept being made for that purpose by the lord high steward, assigning a day, and the place of trial, and for summoning the peers, twelve of whom are at least to be present, and as many more as choose to be present. The day of trial being come, and the lord high steward being seated in his usual state, after the commission is read, and the particular ceremonies are over, his lordship declares to the prisoner at the bar, the cause of their assembly, assures him of justice, and at the same time encourages him to answer without fear; on which the indictment is read over, and the prisoner arraigned; when after hearing all the evidence produced for the king, and the prisoner's answer, the prisoner is ordered to withdraw from the bar, when the lords go to some place by themselves to consider of the evidence; and afterwards being returned, in order to give their verdict, the lord high steward openly demands of the lords one by one, beginning with the puisne lord, whether the prisoner, calling him by his name, be guilty of the crime for which he is arraigned; when laying their right hand on their left breast, they separately answer either guilty or not guilty, upon their honour; and if he be found guilty by a majority of votes more than twelve, he is brought to the bar again, when the lord high steward acquaints the prisoner with the verdict of his peers, and passes sentence and judgment accordingly. It has been adjudged, that where such trial is by commission, as above, the lord high steward, after a verdict given, may take time to advise upon it, and his office continues till he passes judgment.

A peer is not to be put upon any inquest, even though the cause has a relation to two peers: but in trials, where any peer is either plaintiff or defendant, there must be two or more knights returned on the jury. Where a peer is defendant in a court of equity, he is not to be sworn to his answer, but it may be upon his honour, as in the trial of peers: however when a peer is to answer to interrogatories, or to make an affidavit, or is to be examined as a witness, he is to be sworn. For the other privileges of the peers, see the articles NOBILITY, PARLIAMENT, &c.

PEERS *of France*, are twelve great lords of that kingdom, of which six are dukes, and six counts; and of these, six are ecclesiastics, and six laymen: thus, the archbishop of Rheims, and the bishop of Laon and Langres are dukes and peers, and the bishops of Chalon on the Marn, Noyons, and Beauvais, are counts and peers. The dukes of Burgundy, Normandy, and Aquitain, are lay peers and dukes; and the counts of Flanders, Champaign, and Toulouse, lay peers and counts. These peers still assist at the coronation of kings, either in person or by their representatives, where each performs the functions attached to his respective dignity: but as the six lay peerages are all at present united to the crown except that of the count of Flanders; six lords of the first quality are chosen to represent them: but the ecclesiastical peers usually assist in person. At present, the title of peer is bestowed on every lord whose estate is erected into a peerage, the number of which is uncertain, as it depends entirely on the king.

PEER, in building. See the article PIER.

PEERESS, a woman who is noble by descent, creation, or marriage.

If a peeress, by descent or creation, marries a person under the degree of nobility, she still continues noble: but if she obtains that dignity only by marriage, she loses it, on her afterwards marrying a commoner; yet, by the curtesy of England, she always retains the title of her nobility. No peeress can be arrested for debt or trespass; for though, on account of their sex, peeresses cannot sit in the house of lords, yet they enjoy the privileges of peers, and therefore all peeresses by birth, are to be tried by their peers.

PEEVIT, or BLACK-CAP, in ornithology, the grey larus, with a black head. See the article LARUS.

This is a very elegant fpecies: its fize is about that of the common tame pigeon; the head is fmall; and the eyes bright, their iris is of a pale, hazel colour; the verges of the eye-lids are red, and they are furrounded with a fine, white plumage; the beak is nearly an inch in length, it is of a fine, bright fcarlet, and is a little bent downwards; the legs are flender; their colour is a blood-red; the claws are black, and the toe behind is very fhort and fmall.

PEGANUM, WILD RUE, or HARMEL, in botany, a genus of the polyandria-monogynia clafs of plants, the flower of which confifts of five oval petals; and its fruit is a trilocular capfule containing a great many fmall feeds.

This herb is faid to have an inebriating and foporific quality.

PEGASUS, in aftronomy, a conftellation of the northern hemifphere, in form of a flying horfe, faid by different authors to contain 19, 20, and 93 ftars.

PEGMATES, in antiquity, a kind of gladiators, who fought on fcaffolds erected on purpofe. See GLADIATORS.

PEGNITS, a river of Franconia, in Germany, which joins its waters with the Regnits a little below Nurenburg.

PEGU, the capital of the kingdom of Pegu, and fituated upon a river of the fame name, in 97° eaft long. and north lat. 17° 30′.

The kingdom of Pegu is extended along the eaft fide of the bay of Bengal.

PEINE, a town of lower Saxony, fourteen miles weft of Brunfwick.

PEKIN, the metropolis of the empire of China, is fituated in eaft long. 111°, and north lat. 40°.

It is about twenty miles in circumference, and is faid to contain 2,000,000 of people.

PELAGIÆ CONCHÆ, in natural hiftory, fuch fhell-fifh as always refide in the deep parts of the fea, or thofe remote from land.

PELAGIANS, a chriftian fect who appeared about the latter end of the fourth, or the beginning of the fifth century.

Pelagius, the author of this fect, was born in Wales, and his name was Morgan, which in the welfh language fignifies fea-born; from whence he had his latin name Pelagius. Some of our antient hiftorians pretend that he was abbot of Bangor: but this is impoffible, becaufe the britifh monafteries were of a later date. St. Auftin gives him the character of a very pious man, and a chriftian of no vulgar rank: according to the fame father, he travelled to Rome, where he affociated himfelf with perfons of the greateft learning and figure, and wrote his commentaries on St. Paul's Epiftles, and his letters to Melania and Demetrias; but being charged with herefy, he left Rome, and went into Africa, and from thence to Jerufalem, where he fettled. He died fomewhere in the eaft, but where is uncertain. He was charged with maintaining the following doctrines: 1. That Adam was by nature mortal, and whether he had finned or not, would certainly have died. 2. That the confequences of Adam's fin were confined to his own perfon. 3. That new-born infants are in the fame condition with Adam before the fall. 4. That the law qualified men for the kingdom of heaven, and was founded upon equal promifes with the gofpel. 5. That the general refurrection of the dead does not follow in virtue of our Saviour's refurrection. 6. That the grace of God is given according to our merits. 7. That this grace is not granted for the performance of every moral act; the liberty of the will, and information in points of duty being fufficient, &c. Pelagius's fentiments were condemned by feveral councils in Africa, and by a fynod at Antioch.

There was alfo a fect of femi-pelagians; who, with the orthodox, allowed of original fin; but denied that the liberty of the will could be fo far impaired thereby, that men could not of themfelves do fomething, which might induce God to afford his grace to one more than another: and as to election, they held, that it depended on our perfeverance; God choofing only fuch to eternal life, as continued ftedfaft in the faith.

PELECANUS, in ornithology, a name fometimes given to the platea, or fpoonbill, as well as to the pelican, properly fo called. See PLATEA and PELICAN.

PELECOIDES, in geometry, a figure in form of an hatchet: fuch is the figure B C D A, plate CXCV. fig. 3. contained under the two inverted quadrantal arcs A B and A D, and the femi-circle B C D. The area of the pelecoides is demonftrated to be equal to the fquare A C, and that again to the parallelogram E B.

It

It is equal to the square A C, because it wants of the square on the left hand the two segments A B and A C, which are equal to the two segments B C and C D, by which it exceeds on the right hand.

PELICAN, *pelicanus*, in ornithology, a genus of birds, of the order of the anseres, the beak of which is very long, crooked, and unguiculated at the extremity: its sides are not denticulated, and the anterior part of the head towards the throat is naked. See ORNITHOLOGY.

To this genus belong the pelican, properly so called, with a bag at the throat, the cormorant, and shag. See the articles CORMORANT and SHAG.

Mr. Edwards describes a pelican brought from the Cape of Good-Hope, which seemed to him to be more than double the size of the largest swan. He tells us, he saw its keeper put his head into the bag, or pouch, under the bill, and that another man's head might have been put in with it.

PELICAN, in chemistry, a kind of double glass-vessel, used in distilling liquors by circulation: it consists of a cucurbit and alembic-head, with two tubes bending into the cucurbit again. See plate CXCVI. fig. 1. n° 1.

But as such vessels are not easily procurable, a simple sort, consisting only of a bolt-head with a long neck, into which the neck of another glass-vessel is inverted, and the juncture well luted, as it must also be in the former, may be seen *ib.* n° 2.

The term pelican is also given to an instrument, used by surgeons for drawing teeth; and likewise for an antient piece of ordnance, carrying a ball of six pounds.

PELISA, a town of lower Hungary, subject to the house of Austria, thirteen miles west of Buda.

PELLETS, in heraldry, those roundles that are black, called also ogresses and gun-stones, and by the French torteaux de sable.

PELLICLE, among physicians, &c. denotes a thin film, or fragment of a membrane.

When any liquor is evaporated in a gentle heat, till a pellicle arise at top, it is called an evaporation to a pellicle; wherein there is just liquor enough left, to keep the salts in fusion.

PELOSO, a town in the kingdom of Naples, thirty-five miles west of Barri.

PELLS, or *clerk of the* PELLS. See the article CLERK.

PELLUCID, the same with diaphanous, or transparent. See DIAPHANOUS.

PELTA, πέλτη, in antiquity, a small light sort of buckler. See BUCKLER.

PELVIS, in anatomy, the lower part of the cavity of the abdomen, thus called from its resemblance to a bason, or ewer, in latin called pelvis. It is formed by the ossa ilia and ischia, the os sacrum, the os coccygis, and the ossa pubis. See the article INNOMINATA OSSA.

The pelvis is much larger in women than in men, to give room for the growth, &c. of the fœtus.

PELVIS *of the kidneys*, is a membranaceous cavity in the kidneys, which sends out several processes called the tubuli of the pelvis, and surrounds the renal papillæ. See KIDNEYS and URETERS.

PELUSIUM, a city of Egypt, now called Damietta. See DAMIETTA.

PEMBRIDGE, a market-town of Herefordshire, thirteen miles north-west of Hereford.

PEMBROKE, the capital of Pembrokeshire, in south Wales: west long. 5°, north lat. 51° 45'. This town sends two members to parliament.

PEN, a little instrument usually formed of a quill; serving to write withal.

Pens are also sometimes made of silver, brass, or iron.

Dutch PENS, are made of quills that have passed through hot ashes, to take off the grosser fat and moisture, and render them more transparent.

Fountain-PEN, is a pen made of silver, brass, &c. contrived to contain a considerable quantity of ink, and let it flow out by gentle degrees, so as to supply the writer a long time without being under the necessity of taking fresh ink.

The fountain-pen is composed of several pieces, as in plate CXCVI. fig. 2. where the middle piece F carries the pen, which is screwed into the inside of a little pipe, which again is soldered to another pipe of the same bigness as the lid G; in which lid is soldered a male screw, for screwing on the cover, as also for stopping a little hole at the place, and hindering the ink from passing through it. At the other end of the piece F is a little pipe, on the outside of which the top-cover H may be screwed. In the cover there goes a port craion, which is to be screwed into the last-mentioned pipe, in order to stop the end of the pipe, into which the ink is to be poured by a funnel.

nel. To ufe the pen, the cover G muft be taken off, and the pen a little fhaken, to make the ink run more freely.

PEN, or PENSTOCK. See PENSTOCK.

PENANCE, a punifhment, either voluntary or impofed by authority, for the faults a perfon has committed. Penance is one of the feven facraments of the romifh church. Befides fafting, alms, abftinence, and the like, which are the general conditions of penance; there are others of a more particular kind, as the repeating a certain number of ave-marys, pater-nofters, and credos, wearing a hair-fhirt, and giving one's felf a certain number of ftripes. In Italy and Spain it is ufual to fee chriftians almoft naked, loaded with chains and a crofs, and lafhing themfelves at every ftep.

The manner of public penance in the romifh church is as follows: the penitent comes into the church in a very plain and modeft garb; if he be under excommunication, he kneels without the church-door; but if not, within the door. The congregation being affembled, the penitentiary prieft fits in a chair in the middle of the nave of the church; and the penitent kneels before him, begging with a loud voice that his fins may be forgiven him: the prieft anfwers with a fhort remonftrance, and enjoins him fuch penance as he thinks proper. He then takes the penitent by the right hand, and leads him to the church-door, where he fays; you are turned out of the church for the fins you have committed, in like manner as Adam, for his difobedience, was driven from Paradife; and then the church-door is fhut againft him. When the penitent has completed the penance enjoined him, he returns back to the penitentiary, with a certificate thereof figned by the minifter of his parifh, and on the day of abfolution, prefents himfelf upon his knees at the church-door, with an unlighted taper in his hand. Prayers being ended, the prieft goes to the church-door, and makes a pretty long exhortation to the penitent; which being done, he takes him by the hand, and leads him into the church. If the penitent be under excommunication, he muft kneel before the prieft, who ftrikes him feveral times on the fhoulders with a whip made of cords.

Penance, in our canon-law, is an ecclefiaftical punifhment chiefly adjudged to the fin of fornication. The punifhment is thus defcribed by the canons: the delinquent is to ftand in the church-porch on fome Sunday bare-headed and bare-foot, in a white fheet, with a white wand in his hand, bewailing himfelf, and begging every one to pray for him; then he is to enter the church, and falling down, is to kifs the ground; and at laft is to be placed on an eminence in the middle of the church, over-againft the minifter, who is to declare the foulnefs of his crime, which is odious to God, and fcandalous to the congregation. If the crime be not notorious, the canons allow the punifhment to be commuted at the parties requeft for a pecuniary mulct, for the benefit of the poor, &c.

PENÆA, in botany, a plant of the tetrandria-monogynia clafs, with a monopetalous campaniform flower; and a quadragonal capfule for its fruit, containing four cells, with two oblong feeds in each.

This plant has been erroneoufly fuppofed to have produced the farcocolla of the fhops. See SARCOCOLLA.

PENATES, in roman antiquity, a kind of tutelar deities, either of countries or particular houfes; in which laft fenfe, they differed in nothing from the lares. See the article LARES.

The penates were properly the tutelar gods of the Trojans, and were only adopted by the Romans, who gave them the title of penates.

PENCE, or *Peter*-PENCE. See PETER.

PENCIL, an inftrument ufed by painters for laying on their colours. Pencils are of various kinds, and made of various materials; the larger forts are made of boars briftles, the thick ends of which are bound to a ftick, bigger or lefs according to the ufes they are defigned for: thefe, when large, are called brufhes. The finer forts of pencils are made of camels, badgers, and fquirrels-hair, and of the down of fwans; thefe are tied at the upper end with a piece of ftrong thread, and inclofed in the barrel of a quill.

All good pencils on being drawn between the lips come to a fine point.

PENCIL is alfo an inftrument ufed in drawing, writing, &c. made of long pieces of black-lead, or red-chalk, placed in a groove cut in a flip of cedar, on which other pieces of cedar being glued, the whole is planed round, and one of the ends being cut to a point, it is fit for ufe.

Thefe

These pencils, on their importation, pay a duty of 2s. $4\frac{72\frac{1}{2}}{100}$d. the grofs, and draw back, on exportation, 2s. $1\frac{87\frac{1}{2}}{100}$d.

PENDANT, an ornament hanging at the ear, frequently confifting of diamonds, pearls, and other precious ftones.

The pendants of the european ladies are extremely fmall, when compared with thofe worn both by men and women in the Eaft-Indies; among whom it is the fafhion to lengthen out the ears, and to enlarge the hole made in them, by putting in pendants fet with ftones of the fize of faucers. Pyrard informs us, that the queen of Calicut, and other ladies of her court, have their ears by this means weighed down to their breafts, and that the holes in them were large enough to pafs the hand through. This they imagine a great beauty, and therefore the common people are not allowed to have their ears ftretched above the length of three fingers. In the Weft-Indies, the Mexicans and other nations, not only hang pendants at their ears; but bore holes in their lips and noftrils, and hang pendants to them.

PENDANTS, in heraldry, parts hanging down from the label, to the number of three, four, five, or fix at moft, refembling the drops in the doric frieze. When they are more than three, they muft be fpecified in blazoning.

PENDANTS, of a fhip, are thofe ftreamers or long colours which are fplit and divided into two parts ending in points, and hung at the head of mafts, or at the yard-arm ends.

PENDANT *feathers*, with falconers, are thofe feathers that grow behind the thighs of an hawk.

PENDANTS, among florifts, the fame with apices, or antheræ. See the articles ANTHERÆ and STAMINA.

PENDENNIS, a caftle in Cornwal, fituated on Falmouth-bay, fifty miles fouth-weft of Launcefton.

PENDENTIVE, in architecture, the whole body of a vault fufpended out of the perpendicular of the walls, and bearing againft the arch-boutants: or according to Daviler, it is the portion of a vault between the arches of a dome, ufually inriched with fculpture.

The pendentives are generally of brick or foft ftone; but care is to be taken, that the couches or beds of mafonry, be always laid level, and in right lines proceeding from the fweep whence the rife was taken: the joints too muft be made as fmall as poffible, to fave the neceffity of filling them up with wood, or of ufing much mortar.

PENDULOUS, a term applied to any thing that bends or hangs downwards: thus, the flowers, whofe flender ftalks are not able to fuftain their heads upright, are called pendulous flowers. See the articles BOTANY and FLOWER.

PENDULUM, in mechanics, denotes any heavy body, fo fufpended as that it may vibrate or fwing, backwards and forwards, about fome fixed point, by the force of gravity. See GRAVITY.

The vibrations of a pendulum are called its ofcillations. See OSCILLATION.

A pendulum, therefore, is any body, B, (plate CXCVI. fig. 3. n° 1.) fufpended upon, and moving about a fixed point, A, as a center.

The nature of a pendulum confifts in the following particulars: 1. The times of the vibrations of a pendulum, in very fmall arches, are all equal. 2. The velocity of the bob, in the loweft point, will be nearly as the length of the chord of the arch which it defcribes in the defcent. 3. The times of vibration in different pendulums, AB, AC, are as the fquare roots of the times of their vibrations. 4. The time of one vibration is to the time of the defcent, through half the length of the pendulum, as the circumference of a circle to its diameter. 5. Whence the length of a pendulum, vibrating feconds, will be found 39.2 inches nearly; and that of an half fecond pendulum 9.8 inches. 6. An uniform homogeneous body BG (*ibid.* n° 2.) as a rod, ftaff, *&c.* which is one third part longer than a pendulum AD, will vibrate in the fame time with it.

From thefe properties of the pendulum we may difcern its ufe as an univerfal chronometer, or regulator of time, as it is ufed in clocks, and fuch like machines. By this inftrument alfo we can meafure the diftance of a fhip, by meafuring the interval of time between the fire and the found of the gun; alfo the diftance of a cloud, by numbering the feconds, or half-feconds, between the lightning and thunder. Thus, fuppofe between the lightning and thunder, we number 10 feconds; then, becaufe found paffes through 1142 feet in one fecond, we have the diftance of the cloud equal to 11420 feet. Again, the height of any room, or

or other object, may be measured by a pendulum vibrating from the top thereof. Thus, suppose a pendulum from the height of a room vibrates once in three seconds; then say, as 1 is to the square of 3. *viz.* 9, so is 39.2 to 352.8 feet, the height required. Lastly, by the pendulum we discover the different force of gravity on diverse parts of the earth's surface, and thence the true figure of the earth. See the article EARTH.

When pendulums were first applied to clocks, they were made very short; and, the arches of the circle being large, the time of vibration through different arches, could not in that case be equal; to effect which, the pendulum was contrived to vibrate in the arch of a cycloid, by making it play between two semi-cycloids C B, C D, (*ibid.* n° 3.) whereby it describes the cycloid B E A D; the property of which curve is, that a body vibrating in it, will describe all its arches, great or small, in equal times.

In all that has been hitherto said, the power of gravity has been supposed constantly the same. But, if the said power varies, the lengths of pendulums must vary in the same proportion, in order that they may vibrate in equal times; for we have shewn, that the ratio of the times of vibration and descent through half the lengths is given, and consequently the times of vibration and descent through the whole length is given: But the times of vibration are supposed equal, therefore the times of descent through the lengths of the pendulum are equal. But bodies descending through unequal spaces, in equal times, are impelled by powers that are as the spaces described, that is, the powers of gravity are as the lengths of the pendulums.

The greatest inconvenience attending this most useful instrument is, that it is constantly liable to an alteration of its length, from the effects of heat and cold, which very sensibly expand and contract all metalline bodies. See the article HEAT.

To remedy this inconvenience, the common method is by applying the bob of the pendulum with a screw; so that it may be at any time made longer or shorter, according as the bob is screwed downwards or upwards, and thereby the time of its vibrations kept always the same. Again, if a glass or metalline tube, uniform throughout, filled with quicksilver, and 58.8 inches long, were applied to a clock, it would vibrate seconds (for $39.2 = \frac{2}{3}$ of 58.8) and such a pendulum admits of a twofold expansion and contraction, *viz.* one of the metal and the other of the mercury, and these will be at the same time contrary, and therefore will correct each other. For by what we have shewn, the metal will extend in length with heat, and so the pendulum will vibrate slower on that account. The mercury also will expand with heat, and since by this expansion it must extend the length of the column upward, and consequently raise the center of oscillation; so that by this means its distance from the point of suspension will be shortened, and therefore the pendulum on this account will vibrate quicker: wherefore, if the circumstances of the tube and mercury are skilfully adjusted, the time of the clock might, by this means, for a long course of time, continue the same, without any sensible gain or loss.

This is the invention of the late ingenious Mr. Graham, in the year 1721, who made a clock of this sort, and compared it with one of the best of the common sort for three years together, and found the errors of the former but about $\frac{1}{8}$ part of the latter; of which the reader may see a farther account in Phil. Transf. n° 392. It is what is now called Mr. Graham's quicksilver-pendulum.

In the forty-seventh volume of the Philosophical Transactions, Mr. Short gives us an account of other inventions to remedy the same inconvenience. Mr. John Harrison, of Barrow, in Lincolnshire, famous for his invention of a clock to find the difference of longitude at sea, without having the least knowledge of what Mr. Graham had done before him, made several experiments upon wires of different metals, in order to find their different degrees of expansion and contraction. He thought that by a proper combination of wires of two different metals, differing considerably in their expansion and contraction, he might be enabled to keep the center of oscillation of a pendulum always at the same distance from the point of suspension. In consequence of these experiments, he made a pendulum consisting of one steel-wire, at the end of which is the bob or weight; and on each side of this wire, four wires alternately brass and steel, so disposed and contrived as to raise the pendulum by the same quantity that it is lengthened by heat, and to let down the

pendu-

pendulum in the ſame proportion as it is raiſed by cold.

Mr. Harriſon, in his firſt machine for meaſuring time at ſea, likewiſe applied this combination of wires of braſs and ſteel, to prevent any alterations by heat and cold. And in the other machines or clocks he has ſince made for the ſame purpoſe, a like method of guarding againſt the irregularities ariſing from this cauſe is uſed, as has been ſhown under the article LONGITUDE.

Mr. Graham alſo made a pendulum conſiſting of three bars, one of ſteel between two of braſs, and the ſteel bar acted upon a lever, ſo as to raiſe the pendulum, when lengthened by heat, and to let it down, when ſhortened by cold; but he found this clock liable to ſudden ſtarts and jerks in its motion.

The ingenious Mr. Ellicott, in the ſame volume of the Tranſactions, deſcribes a pendulum of his invention, compoſed of braſs and iron, with the method of applying it, ſo as to avoid the many jerks to which the machine might be liable.

But beſides the irregularities ariſing from heat and cold, pendulum-clocks are liable to others from friction and foulneſs; to obviate which, Mr. Harriſon has ſeveral excellent contrivances, whereby his clocks are almoſt entirely free from friction, and never need to be cleaned. See FRICTION and LONGITUDE.

PENE, a river of upper-Saxony, in Germany, which ſeparates the ſwediſh territories from thoſe of Brandenburg.

PENEMUNDER, a fortreſs of Germany, in the circle of upper-Saxony and dutchy of Pomerania, ſituated on the iſle of Uſedom, at the mouth of the river Pene, in eaſt long. 14° 10′, north lat. 54° 20′.

PENETRABILITY. See the article IMPENETRABILITY.

PENETRALE, in roman antiquity, properly denoted the chapel conſecrated to the penates, or houſhold-gods.

PENETRATION, *penetratio*, the act whereby one thing acts upon another, or takes up the place already poſſeſſed by another.

Chauvinus defines penetration the co-exiſtence of two or more bodies, ſo as one is preſent, or has its extenſion in the ſame place as the other.

Philoſophers hold the penetration of bodies abſurd, *i. e.* that two bodies ſhould be at the ſame time in the ſame place; and, accordingly, impenetrability is laid down as one of the eſſential properties of matter. What is commonly therefore meant by penetration, only amounts to the matter of one body being admitted into the vacuities of another.

PENFORD, a market-town of Somerſetſhire, ſituated ten miles weſt of Bath.

PENGUIN ISLAND and BAY, are ſituated on the coaſt of Patagonia in ſouth-America: weſt long. 70°, ſouth lat. 47°.

PENGUIN, in ornithology, a name given to a ſpecies of the alca, with eight furrows on the beak, and a white ſpot before the eye. It is a very large and ſingular bird, equal to the common gooſe in ſize; the head is large and flatted on the crown; the eyes are pretty large, and their iris grey with a tinge of yellow: the beak is of a kind of triangular figure, compreſſed at the ſides, and a little hooked juſt at the extremity: the wings and tail are ſhort, the feet ſtand backward, and the toes are connected by a membrane. See the article ALCA.

PENICHE, a port-town of Portugal, in the province of Eſtremadura, ſituated on the Ocean, forty miles north of Liſbon: weſt long. 9° 6′, north lat. 39° 20′.

PENICK, a town of Germany, in the marquiſate of Miſnia, ſituated ſixteen miles ſouth eaſt of Altenburg.

PENICILLA, in pharmacy, a lozenge, or form of medicine, made round by rolling. See the article LOZENGE.

PENICILLUS, among ſurgeons, is uſed for a tent to be put into wounds or ulcers. See the article TENT.

PENIDIUM SACCHARUM, in pharmacy, is prepared thus: diſſolve ſugar as much as you pleaſe, clarify it with the white of an egg; then ſtrain and inſpiſſate it gently, or ſlowly, till great bubbles ariſe: this done take it off the fire till the bubbles ſubſide, and then pour it out upon a board which has been rubbed over with oil of almonds; and when it is ſomewhat hardened, take it up with your hook, and with your hand ſprinkled with ſtarch, ſpeedily reduce it into its proper form, and lay it up for uſe.

It is good againſt colds, to moderate the acrimonies of the breaſt, promote expectoration, &c.

PENINSULA, in geography, a portion or extent of land, joining to the continent by a narrow neck, or iſthmus; the reſt being encompaſſed with water.

PENIS, the YARD, in anatomy, the primary organ of generation in man; being called alſo mentula, virgo, priapus, and by a multitude of other names.

Anato-

Anatomifts divide the penis into three parts, the body, the glans, and the urethra. In the body of the penis, are obfervable the cuticle and cutis, as the common integuments; the prepuce, being a reduplication of the cutis covering the glans; and in the lower part of this is fixed the frenulum, all which are defcribed under their feveral heads. See the articles CUTICLE, CUTIS, PREPUCE, and FRÆNUM.

After thefe is obfervable the proper teguments or coats of the penis. This is a robuft coat, of a membranous nature, furrounding every part of the penis. It is fometimes double, and has in the interftitial fpace a cellulofe coat which is difcoverable by inflation and drying in that ftate. Under this are the two bodies which conftitute the penis; thefe, being called the corpora cavernofa, or fpongiofa, are defcribed under the article CAVERNOSE.

For a defcription of the other two parts of the penis, *viz.* the glans and urethra, fee GLANS and URETHRA.

The penis is joined by fynchondrofis to the offa pubis, by means of a ligament called ligamentum Vefalii, as alfo by its lateral ligaments. The mufcles of the penis are numerous: they ferve principally for the erecting it. See MUSCLE. The veffels of the penis are very numerous, and are diftributed through it in a very furprifing and beautiful manner. To the confideration of the penis there yet alfo belong the glands, called from their difcoverer glandulæ Cowperi mucofæ: he defcribes three of them, two of which are fituated regularly one on each fide of the urethra, between the mufculi acceleratores and the bulb: they are faid to be of an oval figure, but fomewhat compreffed, and of the fize of a horfebean. They fecrete a mucous pellucid liquor, which each difcharges at its own duct into the urethra: the ufe of the fluid which they fecrete feems to be that of lubricating the urethra, and defending it from being hurt by the acrimony of the urine. The third of them, which is fingle, is in the angle of the curvature of the urethra, under the os pubis, and within the corpus cavernofum: fuch are the glandulæ Cowperi. Finally, the glandula Littrii is fituated juft below the proftata, and lodged between the two membranes and coats of the urethra: the ufe of this gland is the fame with thofe already defcribed. The veffels of the penis, urethra, and thefe glands, are in common: their arteries are from the hypogaftrics, and thofe of the pudenda: the veins, which all have valves, carry back the blood to the veins of the fame parts; but before they join them, they make various anaftomofes, and form a wonderful kind of reticulation in the body of the penis. The nerves come from the laft of thofe of the os facrum, and the lymphatic veffels are numerous.

The ufes of the penis are two, *viz.* a primary and a fecondary: the primary ufe of it is to ferve in the office of generation, and the fecondary for the excretion of the urine.

For the diforders of the penis, fee the articles GONORRHOEA, *with its fymptoms* PHIMOSIS, PARAPHIMOSIS, &c.

PENISCOLA, a port-town of Spain, in the province of Valencia, fituated on the Mediterranean, under the meridian of London, and in north lat. 40° 29′.

PENITENCE, *pænitentia,* properly fignifies the fame with repentance; but is alfo ufed for the difcipline, or punifhment, more ufually called penance. See the article PENANCE.

There are feveral orders of penitence, confifting either of converted debauchees, reformed proftitutes, or perfons who devote themfelves to the office of reforming them: fuch are the order and congregation of penitence of St. Magdalen, in France; the converts of the name of Jefus, at Seville; and the penitents of Orvietto.

PENITENTS, an appellation given to certain fraternities of penitents diftinguifhed by the different fhape and colour of their habits. Thefe are fecular focieties, who have their rules, ftatutes, and churches, and make public proceffions under their particular croffes or banners. Of thefe there are more than a hundred, the moft confiderable of which are as follows: the white penitents, of which there are feveral different forts at Rome, the moft antient of which was conftituted in 1264: the brethren of this fraternity every year give portions to a certain number of young girls, in order to their being married: their habit is a kind of white fackcloth, and on the fhoulder is a circle, in the middle of which is a red and white crofs. Black penitents, the moft confiderable of which are the brethren of mercy, inftituted in 1488, by fome Florentines, in order to affift criminals

minals during their imprisonment, and at the time of their death: on the day of execution, they walk in procession before them, singing the seven penitential psalms and the litanies; and after they are dead, they take them down from the gibbet and bury them: their habit is black sackcloth. There are others, whose business it is to bury such persons as are found dead in the streets: these wear a death's head on one side of their habit. There are also blue, grey, red, green, and violet penitents; all which are remarkable for little else besides the different colours of their habits.

Mabillon tells us, that at Turin there are a set of penitents kept in pay to walk through the streets in procession, and cut their shoulders with whips, *&c.*

PENITENTIAL, an ecclesiastical book retained among the romanists; in which is prescribed what relates to the imposition of penance, and the reconciliation of penitents. See the article PENANCE.

There are various penitentials, as the roman penitential, that of the venerable Bede, that of pope Gregory III. *&c.*

PENITENTIARY, in the antient christian church, a name given to certain presbyters, or priests, appointed in every church to receive the private confessions of the people, in order to facilitate public discipline, by acquainting them what sins were to be expiated by public penance, and to appoint private penance for such private crimes as were not proper to be publicly censured.

PENITENTIARY, at the court of Rome, is an office in which are examined and delivered out the secret bulls, graces, or dispensations relating to cases of conscience, confessions, *&c.*

PENITENTIARY is also an officer, in some cathedrals, vested with power from the bishop to absolve, in cases reserved to him. The pope has at present his grand penitentiary, who is a cardinal, and the chief of the other penitentiary priests established in the church of Rome, who consult him in all difficult cases. He presides in the penitentiary, dispatches dispensations, absolutions, *&c.* and has under him a regent and twenty-four proctors, or advocates of the sacred penitentiary.

PENKRIDGE, a market-town, four miles south of Stafford.

PENMANMAUR, one of the highest mountains in Wales, in Carnarvonshire.

PENNAFLOR, a town of Spain, in Asturias, fifteen miles south-west of Orviedo.

PENNATED, or PINNATED, among botanists. See the article PINNATED.

PENNON, or PENON, a kind of standard, with a long tail, antiently belonging to a simple gentleman. It is opposed to the banner, which was square. See the article BANNER.

PENNY, an antient silver-coin, which, though now little used, was the only one current among our saxon ancestors. See the article COIN.

PENNY-EARTH, in agriculture, denotes a hard, loamy, or sandy earth, with a large proportion of sea-shells intermixed with it.

PENNY-POST. See the article POST.

PENNY-WEIGHT, a troy-weight, containing twenty-four grains, each of which is equal in weight to a grain of wheat, gathered out of the middle of the ear, and well dried. See WEIGHT.

PENON, or PENNON. See PENNON.

PENON DE VELEZ, a port-town of Barbary, situated on the Mediterranean, eighty miles south-east of the Streights of Gibraltar.

PENRISE, a port-town of Wales, in the county of Glamorgan, situated on Bristol-channel, seventeen miles south of Caermarthen.

PENRITH, a market-town of Cumberland, sixteen miles south of Carlisle.

PENRYN, a borough-town of Cornwal, near a bay of the English-channel: west long. 5° 35′, north lat. 50° 20′. It sends two members to parliament.

PENSANCE, a market-town of Cornwal, eight miles east of the Land's end.

PENSILVANIA, one of the english plantations in America, two hundred miles in length, and almost as much in breadth: situated between 74 and 78° of west longitude, and between 39 and 42° of north latitude: a fine fruitful country, bounded by the five nations of the Iroquois on the north; by New-Jersey and New-York on the east; and by Maryland on the south and west. It is a proprietary government, the heirs of Mr. Penn, a quaker, who settled this country, appointing the governor.

PENSION, a sum of money paid annually for services or considerations already past. The yearly payment of each member to the houses of the inns of courts, are likewise termed pensions; and the yearly assembly

sembly of the members of the society of Gray's Inn, to consult on the affairs of the house, is also called a pension.

PENSIONARY, or PENSIONER, a person who has an appointment, or yearly sum, payable during life, by way of acknowledgment, charged on the estate of a prince, company, or particular person. See the article ANNUITY.

Grand PENSIONARY, an appellation given to the first minister of the States of Holland. The grand pensionary is chairman in the assemblies of the states of that province; he proposes the matters to be consulted on; collects the votes; forms and pronounces the resolutions of the states; opens letters; confers with foreign ministers, *&c.* His business is also to inspect the finances, to maintain the authority of the states, and to see that the laws are observed; and he is perpetual deputy of the states-general of the United-Provinces. His commission is however given him only for five years; after which it is deliberated whether or no it shall be renewed; but there is no instance of its being revoked: therefore death only puts an end to the functions of this important minister.

PENSIONARY, is also the first minister of the regency of each city in Holland. His office is to give his advice in affairs relating to the government either of the state in general, or of the city in particular; and in assemblies of the states of the province, he is speaker in behalf of his city. The function, however, of these pensionaries is not every where alike: in some cities they only give their advice, and are never found in assemblies of the magistrates, except when expresly called thither: in others they attend constantly; and in others they make the propositions on the part of the burgomasters, draw up their conclusions, *&c.* They are called pensionaries, because they receive an appointment or pension.

PENSIONER, in general, denotes a person who receives a pension, yearly sallary, or allowance. Hence,

The band of gentlemen-pensioners, the noblest sort of guard to the king's person, consists of forty gentlemen, who receive a yearly pension of one hundred pounds. This honourable band was first instituted by king Henry VIII. and their office is to attend the king's person, with their battle-axes, to and from his chapel-royal, and to receive him in the presence chamber, or coming out of his privy-lodgings: they are also to attend at all great solemnities, as coronations, St. George's feast, public audiences of embassadors, at the sovereign's going to parliament, *&c.* They are each obliged to keep three double horses and a servant, and so are properly a troop of horse. They wait half at a time, quarterly; but on Christmas-day, Easter-day, Whitsunday, *&c.* and on extraordinary occasions, they are all obliged to give their attendance. They have likewise the honour to carry up the sovereign's dinner on the coronation-day, and St. George's feast; at which times, the king or queen usually confer the honour of knighthood on two such gentlemen of the band as their captain presents.

Their arms are gilt battle-axes; and their weapons, on horse-back, in time of war, are curassiers-arms, with sword and pistols. Their standard, in time of war, is, argent, a cross gules. Their captain is always a nobleman, who has under him a lieutenant, a standard-bearer, a clerk of the check, secretary, paymaster, and harbinger.

PENSTOCK, a sluice, or flood-gate, serving to retain or let go, at pleasure, the water of a mill-pond, or the like. See the article SLUICE.

PENTACHORD, an antient musical instrument, with five strings, whence the name.

The strings were of bullocks-leather, and struck with a plectrum made of goats-horn.

PENTACROSTIC, in poetry, a set of verses so disposed as that there are always five acrostics of the same name, in five divisions of each verse. See ACROSTIC.

PENTAEDROSTYLA, in natural history, the name of a genus of spars. See the article SPAR.

The bodies of this genus are spars, in form of pentangular columns, terminated by pentangular pyramids at one end, and irregularly affixed at the other to some solid body.

Of this genus there are three known species. 1. One with a very long pyramid. This is found in the mines on Mendip-hills. 2. One with a thick column, and a very short and large pyramid. This is found in the Hartz-forest in Germany, and in Cumberland. And, 3. One with a broad depressed pyramid. This is found, so far as it is yet known, only in the mines at Rammelsberg in the Hartz forest in Germany.

PENTAGON, in geometry, a figure of five fides and five angles.

If the five fides be equal, the angles are fo too, and the figure called a regular pentagon: fuch is A B C D E (plate CXCVI. fig. 4.) infcribed in the circle.

The moft confiderable property of a pentagon is, that one of its fides, D E, is equal in power to the fides of a hexagon and a decagon, infcribed in the fame circle A B C D E; that is, the fquare of the fide D E, is equal to the fum of the fquares of the fides *d* E and E *b*.

The area of a pentagon, like that of any other polygon, may be obtained by refolving it into triangles. See the articles TRIANGLE and POLYGON.

Pappus has alfo demonftrated, that twelve regular pentagons contain more than twenty triangles infcribed in the fame circle, lib. v. probl. 45.

The dodecahedron, which is the fourth regular folid, confifts of twelve pentagons.

In fortification, pentagon denotes a fort with five baftions.

PENTAGRAPH, or PARALLELOGRAM, an inftrument whereby defigns of any kind may be copied in what proportion you pleafe, without being fkilled in drawing.

It confifts of four brafs or wooden rulers, (plate CXCVI. fig. 5.) two of them from fifteen to eighteen inches long; the other two half that length. At the ends and middle of the long rulers, as alfo at the ends of the fhorter, are holes, upon the exact fixing whereof, the perfection of the inftrument chiefly depends. Thofe in the middle of the long rulers are to be at the fame diftance from thofe at the ends of the long ones, and thofe of the fhort ones, fo as to form a parallelogram.

It is fitted together by a large pillar *a*, having at one end a fcrew and nut, whereby the two long rulers are joined, and at the other a little knot for the inftrument to flide on: *b* is a rivet with a fcrew and nut, wherewith each fhort ruler is faftened to the middle of each long one: *c* is a pillar, one end whereof, being hollowed into a fcrew, has a nut fitted to it; at the other end is a worm to fcrew into the table; when the inftrument is to be ufed, it joins the ends of the two fhort rulers: *d* is a pen or pencil fcrewed into a little pillar: *e* is a brafs-point, moderately blunt, fcrewed, likewife, into a little pillar.

Ufe of the PENTAGRAPH. 1. To copy a defign in the fame fcale as the original: fcrew the worm *c* into the table; lay a paper under the pencil *d*, now placed at *f*, and the defign under the point *e*, now placed at *g*; then, conducting the point over the feveral lines of the defign, the pencil *f* will draw the fame on the paper.

2. If the defign be to be reduced into half, &c. the fpace, the worm muft be placed at the end of the long ruler *d*, and the paper and pencil on the middle. In this fituation conduct the brafs-point as before, and the pencil will draw its copy in the proportion required, the pencil here moving half the length that the point does.

On the contrary, if the defign be to be enlarged by one half, the brafs point, with the defign, muft be placed in the middle at *c*, the pencil and paper at the end of the long ruler, and the worm at the other.

3. To enlarge or reduce in other proportions, there are holes drilled at equal diftances on each ruler, namely, all along the fhort ones, and half way the long ones, in order for placing of the brafs-point, pencil, and worm, in a right line therein; that is, if the piece carrying the point be put in the third hole, the two other pieces muft be put in its third hole.

If then the point and defign be placed at any hole of the great ruler, and the pencil with the paper at any hole of the fhort ruler, which forms the angle therewith, the copy will be lefs than half the original. On the contrary, if it be placed at one of the holes of that fhort ruler, which is parallel to the long ruler, the copy will be greater than half the original.

Few of thefe inftruments will do any thing tolerably but ftraight lines, and many of them not thofe.

PENTAMETER, in antient poetry, a kind of verfe confifting of five feet, or metres; whence the name.

The two firft feet may be either dactyls or fpondees, at pleafure; the third is always a fpondee, and the two laft anapefts: fuch is the following verfe of Ovid.

1 2 3 4 5
Carmini|bus vi|ves tem|pus in o|mne meis.

A pentameter verfe, fubjoined to an hexameter, conftitutes what is called elegiac. See the article ELEGIAC.

PENTANDRIA, in botany, one of Linnæus's

næus's classes of plants, the fifth in order; the characters of which are, that all the plants comprehended in it have hermaphrodite flowers, with five stamina or male parts in each: they are subdivided into orders, which are denominated monogynia, digynia, trigynia, *&c.* according as there are one, two, three, *&c.* pistils, or female parts, in each flower. See the article STAMINA.

To this genus belongs the vine, of the order of the monogynia; the elm, of the digynia; sumach, of the trigynia, *&c.*

PENTAPETALOUS, an appellation given to flowers that consist of five petals or leaves. See the article FLOWER.

PENTAPETES, in botany, a genus of the monadelphia-polyandria class of plants, the calyx of which is simple; the stamina are at least twenty in number, five of which are very long and sterile, and the fruit is a capsule, containing five cells, with membranaceous seeds.

PENTAPOLIS, in geography, denotes a country wherein are only five cities: such was the pentapolis of Egypt, or Cyrenaica, which contained the five cities Berenice, Arsinoë, Ptolemais, Cyrene, and Apollonia.

PENTAPTOTON, in grammar, denotes a noun which has only five cases.

PENTASTICH, πενταστιχον, in poetry, a stanza, or division of a poem, consisting of five verses; whence the name.

PENTASTYLE, in architecture, a building wherein there are five rows of columns. See the article COLUMN.

PENTATEUCH, πεντατευχος, an appellation given to the first five books of the Old Testament, *viz.* Genesis, Exodus, Leviticus, Numbers, and Deuteronomy. See the article GENESIS, *&c.*

The Samaritans acknowledge no other scriptures besides the Pentateuch, which they still preserve in the old hebrew or phœnician character, as also in the vulgar samaritan.

PENTATHLON, in antiquity, a general name for the five exercises performed at the grecian games, *viz.* wrestling, boxing, leaping, running, and playing at the discus. See the articles GAMES, WRESTLING, *&c.*

PENTATONON, in the antient music, a concord called by us the redundant sixth. See the article SIXTH.

PENTECOST, a solemn festival of the Jews, so called because it was celebrated on the fiftieth day after the sixteenth of the month Nisan, which was the second day of the passover. See PASSOVER.

The feast of pentecost was instituted in memory of the law's being given, on the fiftieth day after the Israelites came out of Egypt.

It was on the feast of pentecost that the Holy Ghost miraculously descended on the apostles. See WHITSUNDAY.

PENTELASMIS, in the history of shell-fish, a genus of animals, composed of a fleshy body, affixed to a fleshy and soft pedicle; the body is composed of five valves, and the pedicle is sometimes short, and in other species considerably long. The animal, inhabiting the shell-body of this genus, is a triton. See the article TRITON.

This genus comprehends the goose-shell, or barnacle, being a tender, brittle shell, about an inch long, and three quarters of an inch in diameter. See the article CONCHA ANATIFERA.

PENTHEMIMERIS, in antient poetry, a part of a verse consisting of two feet and a long syllable.

PENTHORUM, in botany, a genus of the decandria pentagynia class of plants, without any flower-petals; the fruit is a single capsule, divided into five parts, with five conic angles, and containing five cells, with numerous seeds in each.

PENULTIMA, or PENULTIMATE SYLLABLE, in grammar, denotes the last syllable but one of a word; and hence the anti-penultimate syllable is the last but two, or that immediately before the penultima.

PENULTIMATE CHORD, in music, according to Brossard, is the same with what the Greeks call paranete, though others will have the paranete to be only the next chord to the ultimate.

PENULTIMATE *of the separate, paranete diazeugmenon*, a name the antients gave to one of the chords of their lyre or system, corresponding to the *de*, *la*, *re* of the third octave of the modern system.

PENULTIMATE *of the acute, paranete hyperbolæon*, a chord of the antient system, answering to the *ge*, *re*, *sol* of the third octave of the modern system.

PENUMBRA, in astronomy, a partial shade observed between the perfect shadow and the full light in an eclipse.

It arises from the magnitude of the sun's body; for were he only a luminous point, the shadow would be all perfect; but by reason of the diameter of the sun, it happens that a place which is not illuminated by the whole body of the sun, does yet receive

receive rays from a part thereof. See the article ECLIPSE.

PEPASMUS, in medicine, denotes the digesting and concocting of morbid humours.

PEPASTIC, or PEPTIC, in physic, are medicaments of the consistence of an emplaister, for bringing humours to a head, and disposing them to maturation.

PEPLIS, WATER-PURSLAIN, in botany, a genus of the hexandria-digynia class of plants, the flower of which consists of five very small oval petals; and its fruit is a cordated bilocular capsule, containing numerous very small and triquetrous seeds.

PEPO, the POMPION, in botany, is comprehended by Linnæus among the cucurbita. See the article CUCURBITA.

PEPPER, *piper*, in natural history, an aromatic berry, of a hot dry quality, chiefly used in seasoning.

We have three kinds of pepper at this time in use in the shops; the black, the white, and the long pepper.

Black pepper is the fruit of a plant of the diandria-trigynia class, without any flower-petals: the fruit itself is roundish and rugose, and disposed in clusters: it is brought from the dutch settlements in the East-Indies. See plate CC. fig. 3.

The common white pepper is factitious, being prepared from the black in the following manner: they steep this in sea-water, exposed to the heat of the sun for several days, till the rind or outer bark loosens; they then take it out, and when it is half dry, rub it till the rind falls off; then they dry the white fruit, and the remains of the rind blow away like chaff. A great deal of the heat of the pepper is taken off by this process; so that the white kind is fitter for many purposes than the black. However, there is a sort of native white pepper, produced on a species of the same plant, which is much better than the factitious, and indeed little inferior to the black.

The long pepper is a dried fruit of an inch or an inch and an half in length, and about the thickness of a large goose-quill: it is of a brownish-grey colour, cylindrical in figure, and said to be produced on a plant of the same genus.

Pepper is principally used by us in food, to assist digestion; but the people in the East Indies esteem it as a stomachic, and drink a strong infusion of it in water by way of giving them an appetite: they have also a way of making a fiery spirit of fermented fresh pepper with water, which they use for the same purposes. They have also a way of preserving the common and long pepper in vinegar, and eating them afterwards at meals.

Common pepper pays a duty, on importation, of 2 s. $4\frac{1}{2}$d. per pound; but if imported immediately from the place of growth in british shipping, it pays only $\frac{47\frac{1}{2}}{100}$d. per pound. Long pepper pays, on importation, $2\frac{32\frac{1}{2}}{100}$d. the pound; and draws back, on exportation, $2\frac{4}{100}$d.

Chiapa-PEPPER, is thought to be the same with Jamaica-pepper.

Jamaica PEPPER, *pimenta*, in botany. See the article PIMENTA.

Indian PEPPER, or *Guinea*-PEPPER, *capsicum*, in botany. See CAPSICUM.

Poor man's PEPPER, or PEPPER WORT, a name given to lepidium. See LEPIDIUM.

Water-PEPPER, is only a species of sedum, or house leek.

PEPPER-BIRD, the english name of a species of ramphastos, with a yellow rump. See the article RAMPHASTOS.

All the species of ramphastos are fond of pepper, but this eats it the most voraciously of them all; whence its english name: it is about the size of our jackdaw; and its beak is six inches, or more, in length, and three inches in diameter at the base.

PEPPER-EEL, in the history of animalcules, a species of enchelis, found in pepper-water and other vegetable infusions. See the articles ENCHELIS and PEPPER-WATER.

PEPPER-MINT, a species of mint. See the article MINT.

PEPPER-WATER, a liquor prepared in the following manner, for microscopical observations: put common black pepper, grossly powdered, into an open vessel so as to cover the bottom of it half an inch thick, and put to it rain or river water, till it covers it an inch; shake or stir the whole well together at the first mixing, but never disturb it afterwards: let the vessel be exposed to the air uncovered; and in a few days there will be seen a pellicle or thin skin swimming on the surface of the liquor, looking of several colours.

This is a congeries of multitudes of small animals; and being examined by the microscope, will be seen all in motion: the animals, at first sight, are so small as not to be distinguishable, unless

to the greateſt magnifiers; but they grow daily till they arrive at their full ſize. Their numbers are alſo continually increaſing, till the whole ſurface of the liquor is full of them, to a conſiderable depth. When diſturbed they will ſometimes all dart down to the bottom, but they ſoon after come up to the ſurface again. The ſkin appears ſooneſt in warm weather, and the animals grow the quickeſt; but in the ſevereſt cold it will ſucceed, unleſs the water freezes.

About the quantity of a pin's head of this ſcum, taken up on the nib of a new pen, or the tip of a hair-pencil, is to be laid on a plate of clear glaſs; and if applied firſt to the third magnifier, then to the ſecond, and, finally, to the firſt, will ſhew the different animalcules it contains, of ſeveral kinds and ſhapes as well as ſizes.

PEPSIS, among phyſicians, denotes the concoction of food or humours in the body. See the article CONCOCTION.

PEPUS, or PEIBUS, a lake ſituated on the confines of Livonia, has a communication with the gulph of Finland, and the lake Werſero in the dominions of Ruſſia.

PEQUIGNY, a town of Picardy, in France, fifteen miles ſouth of Abbeville.

PERA, one of the ſuburbs of Conſtantinople, where ambaſſadors and chriſtians uſually reſide.

PERAMBULATION, in law, ſignifies the walking about a foreſt, pariſh, or the like, by juſtices or others, in order to mark down and preſerve the limits and bounds thereof.

PERAMBULATIONE FACIENDA, a writ commanding the ſheriff to make perambulation, in order to ſettle the bounds of two adjoining manors.

This writ is only iſſued, where the two lords of the manors agree to ſuch perambulation; for if either of them refuſe, the other ſhall have the writ de rationabilibus diviſis. See RATIONABILIBUS.

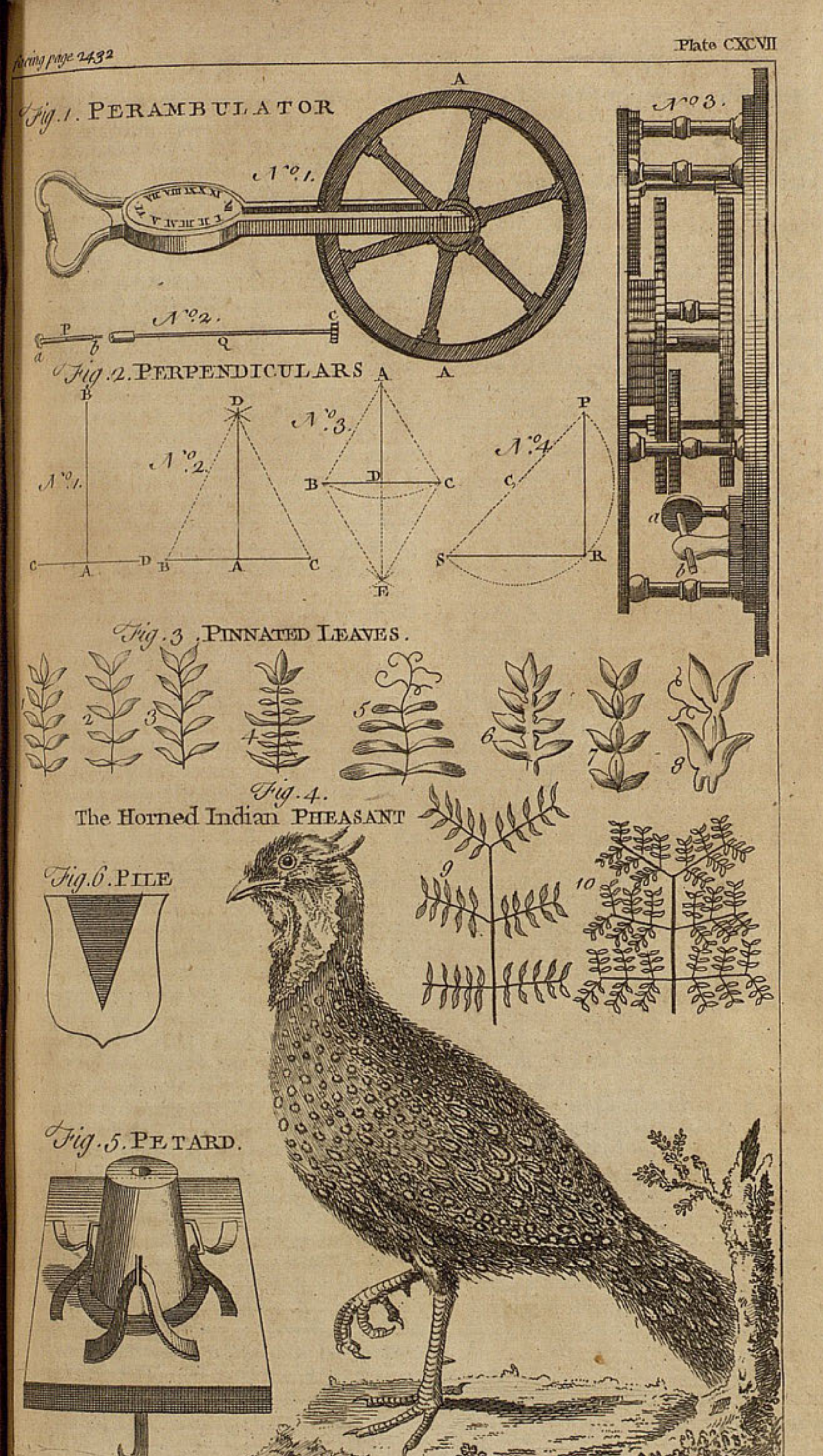
PERAMBULATOR, in ſurveying, an inſtrument for meaſuring diſtances, called alſo pedometer, way-wiſer, and ſurveying wheel.

It conſiſts of a wheel AA (pl. CXCVII. fig. 1. n° 1.) two feet ſeven inches and a half in diameter; conſequently, half a pole, or eight feet three inches in circumference. On one end of the axis is a nut, three quarters of an inch in diameter, and divided into eight teeth; which, upon moving the wheel round, fall into the eight teeth of another nut *c* (*ibid.* n° 2.) fixed on one end of an iron-rod Q, and thus turn the rod once round, in the time the wheel makes one revolution. This rod, lying along a groove in the ſide of the carriage of the inſtrument, under the dotted line, has at its other end a ſquare hole, into which is fitted the end *b* of a ſmall cylinder P. This cylinder is diſpoſed (*ibid.* n° 3.) under the dial-plate of a movement, at the end of the carriage B, in ſuch a manner as to be moveable about its axis: its end *a* is cut into a perpetual ſcrew, which falling into the thirty-two teeth of a wheel perpendicular thereto, upon driving the inſtrument forward, that wheel makes a revolution each ſixteenth pole. On the axis of this wheel is a pinion with ſix teeth, which, falling into the teeth of another wheel of ſixty teeth, carries it round every hundred and ſixtieth pole, or half a mile.

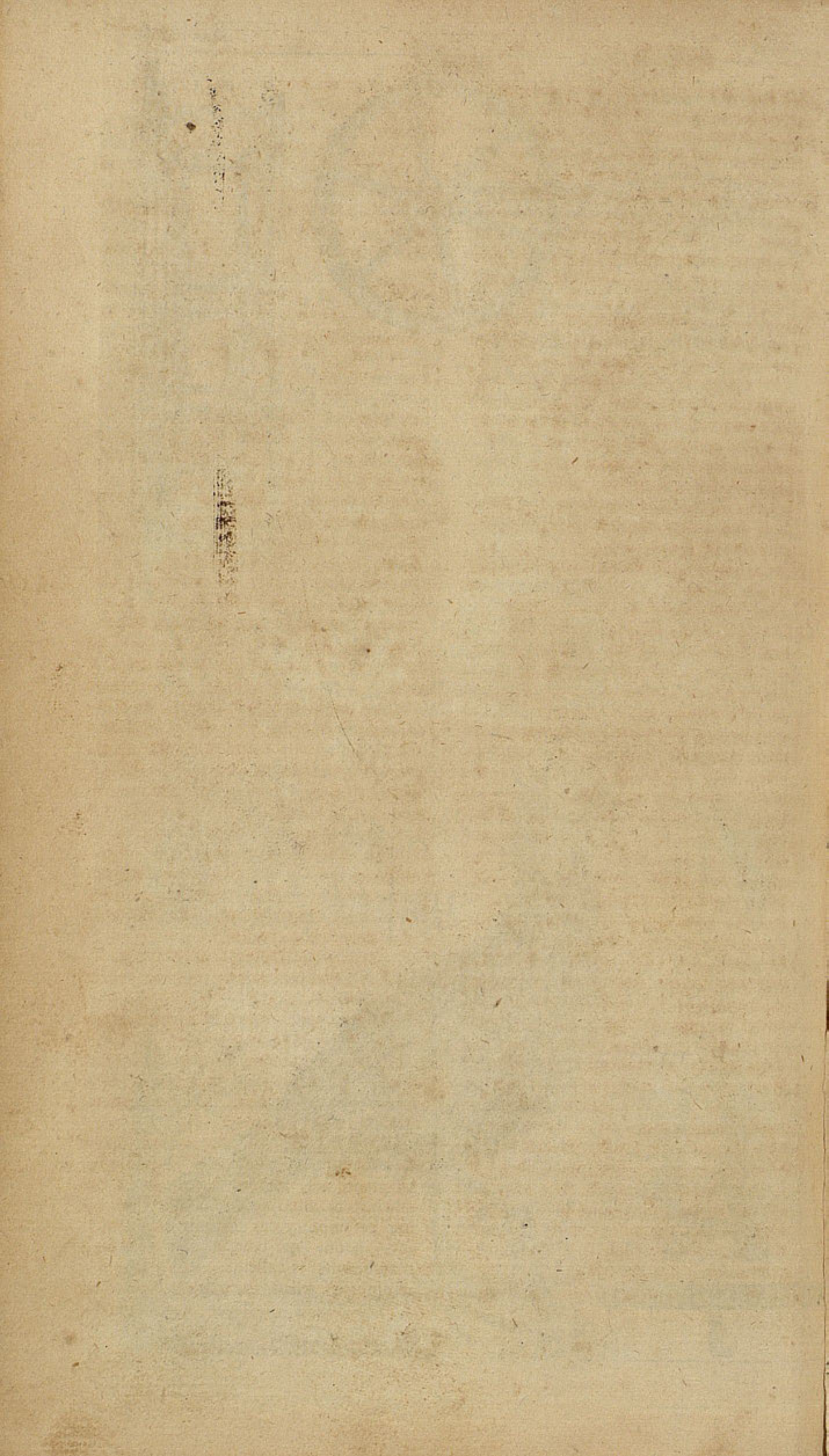
This laſt wheel, carrying a hand or index round with it over the diviſions of a dial-plate, whoſe outer limb is divided into one hundred and ſixty parts, correſponding to the one hundred and ſixty poles, points out the number of poles paſſed over. Again, on the axis of this laſt wheel is a pinion, containing twenty teeth, which, falling into the teeth of a third wheel, which hath forty teeth, drives it once round in three hundred and twenty poles, or a mile. On the axis of this wheel is a pinion of twelve teeth, which, falling into the teeth of a fourth wheel, having ſeventy-two teeth, drives it once round in twelve miles.

This fourth wheel, carrying another index over the inner limb of the dial-plate, divided into twelve for miles, and each mile ſubdivided into halves, quarters, and furlongs, ſerves to regiſter the revolutions of the other hand, and to keep account of the half miles and miles paſſed over as far as twelve miles.

The uſe of this inſtrument is obvious from its conſtruction. Its proper office is in the ſurveying of roads and large diſtances, where a great deal of expedition, and not much accuracy, is required. It is evident, that driving it along, and obſerving the hands, has the ſame effect as dragging the chain, and taking account of the chains and links. Its advantages are its handineſs and expedition; its contrivance is ſuch, that it may be fitted to the wheel of a coach, in which ſtate it performs its office, and meaſures the road without any trouble at all.



T. Jefferys sculp.



PER ARSIN ET THESIN, in mufic. Per arfin, in a fong, counterpoint, figure, &c. is when the notes afcend from grave to acute; and per thefin, when they defcend from acute to grave.

PERCA, the PEARCH, in ichthyology, a genus of the acanthopterygious order of fifhes, the characters of which are, that the branchioftege membrane on each fide contains feven bones, and the back has one or two fins.

Befides the common pearch, this genus comprehends the lucius and lucioperca. See LUCIUS and LUCIOPERCA.

The pearch is diftinguifhed by feveral tranfverfe ftreaks, and by having the belly-fins red: it grows in fome places to a foot and an half in length, and is confiderably thick in proportion; but its more ufual fize is eight or nine inches in length: its noftrils are large and patulous, and nearer the eyes than the extremity of the fnout.

PERCASLAW, or PEREJESLAW, a city of the Ukrain, in Ruffia, forty-four miles fouth-eaft of Kiof.

PERCEPTION, in logic, the firft and moft fimple act of the mind, whereby it perceives or is confcious of its ideas. See the article IDEA.

In bare perception, the mind is for the moft part only paffive; yet impreffions made on the fenfes caufe no perception, unlefs they are taken notice of by the mind, as we fee in thofe who are intently bufied in the contemplation of certain objects. It ought alfo to be obferved, that the ideas we receive by perception are often altered by the judgment, without our taking notice of it; fo that we take that for the perception of our fenfes, which is but an idea formed by the judgment: thus, a man who reads, or hears, with attention, takes little notice of the characters or founds, but of the ideas excited in him by them. See the article JUDGMENT.

The faculty of perception feems to be that which conftitutes the diftinction between the animal kingdom and the inferior parts of nature. Perception is alfo the firft ftep towards knowledge, and the inlet of all the materials of it; fo that the fewer fenfes a man has, and the duller the impreffions that are made by them are, the more remote he is from that knowledge which is to be found in other men. See KNOWLEDGE.

PERCH, or PEARCH, *perca*. See PERCA.

PERCH, a meafure of length. See the article MEASURE.

PERCHANT, among fowlers, denotes a decoy-bird, which being faftened by the foot, flutters about the place to draw other birds to it.

PERCHE, a territory of Orleanois, bounded by Normandy on the north.

PERCOLATION, the fame with filtration. See the article FILTRATION.

PERCUSSION, in mechanics, the impreffion a body makes in falling or ftriking upon another, or the fhock of two bodies in motion. See the article MOTION.

Percuffion is either direct or oblique; direct, when the impulfe is given in a line perpendicular to the point of contact; and oblique, when it is given in a line oblique to the point of contact. See the article CENTER.

The ratio which an oblique ftroke bears to a perpendicular one, is as the fine of the angle of incidence to the radius. Thus, let ab (plate CXCVI. fig. 6.) be the fide of any body on which an oblique force falls, with the direction da; draw dc at right angles to db, a perpendicular let fall from d to the body to be moved, and make ad the radius of a circle; it is plain that the oblique force da, by the laws of compofition and refolution of motions, will be refolved into the two forces dc and bd; of which dc, being parallel to ab, hath no energy or force to move that body; and, confequently, db expreffes all the power of the ftroke or impulfe on the body to be moved: but db is the right fine of the angle of incidence dab; wherefore the oblique force da, to one falling perpendicularly, is as the fine of the angle of incidence to the radius.

PER DELIQUIUM. See DELIQUIUM.

PERDIX, the partridge. See the article PARTRIDGE.

PERDUES, or ENFANS PERDUES. See the article FORELORN HOPE.

PEREGRINE, among aftrologers, a term applied to a planet, when found in a fign where it has none of its five effential dignities.

PEREMPTORY, in law, where joined to a fubftantive, denotes a final and determinate act, without any hope of renewing or altering the fame: thus we find peremptory day, action, mandamus, &c. in our law-books. But yet there may be what is called a putting off a peremptory, when the matter cannot be

fpoken

ſpoken to at the day fixed, on account of other buſineſs; and this is done by motion of the party, that the court will give a farther day without prejudice to him.

PERENNIAL, in botany, is applied to thoſe plants whoſe roots will abide many years, whether they retain their leaves in winter or not: thoſe which retain their leaves are called ever greens; but ſuch as caſt their leaves, are called deciduous, or perdifols. Some of theſe have annual ſtalks, which die to the root every autumn, and ſhoot up again in the ſpring; to which Jungius gives the title of radix reſtibilis.

PERENNIAL WINDS. See WIND.

PERETERION, a name which chirurgical writers give to the perforating part of the trepan. See the article TREPAN.

PERFECT, ſomething to which nothing is wanting; or that has all the requiſites of its nature and kind.

PERFECT, in arithmetic. Perfect number is that, all whoſe aliquot parts added together, make the ſame number with the number whereof they are ſuch parts.

PERFECT PRETERIT TENSE, in grammar. See the article PRETERIT.

PERFECT, in muſic, denotes ſomething that fills and ſatisfies the mind and the ear: in which ſenſe we ſay, perfect cadence, perfect concord, *&c.*

The antients had two kinds of concords, the major and minor, and each of theſe again was either perfect or imperfect. The word perfect, when joined to the words mode and time, uſually expreſſes triple time, or meaſure; in oppoſition to double time, which they called imperfect. See the article TIME.

PERFECTION, the ſtate or quality of a thing perfect. See the laſt article.

Perfection is divided, according to Chauvinus, into phyſical, moral, and metaphyſical. Phyſical or natural perfection, is that whereby a thing has all its powers or faculties, and thoſe too in full vigour; and all its parts both principal and ſecondary, and thoſe in their due proportion, conſtitution, *&c.* in which ſenſe man is ſaid to be perfect, when he has a ſound mind in a ſound body. This perfection is by the ſchools frequently termed ενεργητικη, becauſe a thing is enabled thereby to perform all its operations.

Moral perfection is an eminent degree of virtue or moral goodneſs, to which men arrive by repeated acts of piety, beneficence, *&c.* This is uſually ſubdivided into abſolute or inherent, which is actually in him to whom we attribute it; in imputative, which exiſts in ſome other, and not in him it is attributed to. Metaphyſical, tranſcendental, or eſſential perfection, is the poſſeſſion of all the eſſential attributes, or of all the parts neceſſary to the integrity of a ſubſtance; or it is that whereby a thing has or is provided of every thing belonging to its nature. This is either abſolute, where all imperfection is excluded, ſuch is the perfection of God; or *ſecundum quid*, and in its kind.

PERFIDIA, in muſic, a term borrowed from the Italians, ſignifying an affection of doing always the ſame thing, of purſuing the ſame deſign, continuing the ſame motion, the ſame ſong, the ſame paſſage, and the ſame figures of notes. Such are the ſtiff or conſtrained baſſes. as thoſe of chacones, becauſe depending wholly on the caprice of the compoſer.

PERFORANS MANUS, in anatomy, a muſcle of the fingers, being the flexor of the third phalanx, called alſo profundus; which, ariſing at the upper part of the middle of the ulna, and dividing into four tendons, perforates the tendons of the perforatus manus, and is inſerted into the beginning of the third phalanx of the four fingers. See the article PERFORATUS, *&c.*

PERFORANS PEDIS, in anatomy, a muſcle of the toes, being the flexor of the third phalanx: its origin is from the hinder ſurface of the upper part of the tibia: towards the middle it is divided into four tendons, and theſe perforate the tendons of the perforatus pedis, and are afterwards terminated in the third phalanx.

PERFORATUS MANUS, in anatomy, a muſcle of the fingers, called alſo ſublimis, being the flexor of the ſecond phalanx, ariſing from the internal condyle of the humerus, and the radius: it is divided into four tendons, which are inſerted into the ſecond phalanges of the four fingers. See FLEXOR, *&c.*

PERFORATUS PEDIS, in anatomy, a muſcle of the toes, being the flexor of the ſecond phalanx, ariſing from the lower and inner ſurface of the calcaneum. It is divided into four tendons, which are perforated and is terminated in the bones of the ſecond phalanx.

PERFUME, *ſuffitus*, an agreeable artificial odour, affecting the organ of ſmelling. The generality of perfumes are made up of

of musk, ambergrise, civet, rose and cedar-woods, orange-flowers, jasmin, jonquils, tuberoses, and other odoriferous flowers: those drugs commonly called aromatics, such as storax, frankincense, benzoin, cloves, mace, &c. enter the composition of a perfume: some are also composed of aromatic herbs or leaves, as lavender, marjoram, sage, thyme, hyssop, &c.

Perfumes were antiently very much in use: but since people are become sensible of the harm they do to the head, they are generally disused among us; however they are still common in Spain and Italy.

PERFUMES, in pharmacy, are topical or external remedies, composed of certain powders and gums, which being mixed together, and thrown on the coals, produce a vapour and smoke of great use in several diseases. There are dry perfumes made up in troches, pills, &c. of olibanum, mastic, olives, &c. and moist viscuous ones mixed with the juices of herbs.

By means of an oil distilled from tartar, Boerhaave observes, that rich perfumes may not only be exalted, but that musk and civet may have their scent invigorated after being decayed, by suspending them in a jakes.

PERGA, a port-town of european Turky, in the province of Albina, opposite to the island of Corfu, in east long. 21°, north lat. 39° 20′.

PERGAMUS, an antient city of the lesser Asia, in the province of Phrygia, situated north of Smyrna.

PERIAGOGE, or PERIBOLE, in rhetoric, is used where many things are accumulated into one period which might have been divided into several.

PERIANTHIUM, in botany, expresses that sort of cup of a flower which either consists of several leaves, or else of one leaf divided into several segments, and surrounds the lower part of the flower. See the article CALYX.

PERIAPTON, περιαπτον, a kind of medicine otherwise called periamma, or amulet, which being tied about the neck, is supposed to prevent or cure diseases. See the article AMULET.

PERICARDIUM, in anatomy, a membranaceous bag, loosely including the heart, and situated in the middle and lower part of the thorax, between the two lobes of the lungs. See HEART.

The figure of the pericardium is conic, like that of the heart itself. Its size is such as can conveniently contain the heart without pressing upon it. It is connected with the mediastinum, with a great part of the diaphragm, and with the large vessels of the heart, which, together with this covering, sustain also the heart itself in its place. In beasts of most kinds, the heart is not at all connected with the diaphragm by its pericardium.

The pericardium is composed of a double membrane; the exterior one is common with the pleura and mediastinum; the interior one is proper, lubricous, and is continuous with the coats of the larger vessels. This membrane, when expanded upon the finger, frequently discovers a great number of foraminula or little apertures. The arteries and veins of the pericardium are from those of the mediastinum and diaphragm, and its nerves are also from the diaphragmatics. Its lymphatics all run to the thoracic duct.

The uses of the pericardium are, 1. To support the heart in a pendulous state, especially when we lie down. 2. To defend the heart from the cold air taken in at the lungs. 3. To preserve it from being injured by water, by matter, or any other extraneous fluid in the cavity of the thorax. And, 4. To contain the liquor of the pericardium, as it is called, which serves to facilitate the motions of the heart.

The liquor of the pericardium is a fluid resembling in appearance water in which raw flesh had been washed. The anatomical writers in general deduce this fluid from certain glands situated either in the pericardium, or in the heart itself; but as these glands are not to be found, Heister thinks it more rational to suppose that it is expressed out of the auricles of the heart in its systole. The pericardium is found sometimes in long hectics to cohere with the substance of the heart; and there are accounts of its having been wholly wanting.

PERICARPIA, in pharmacy, the same with epicarpia. See EPICARPIUM.

PERICARPIUM, among botanists, a covering or case for the seeds of plants. It is the germen of the pistil enlarged: there are no less than nine species of pericarpia: 1. A capsule. 2. A conceptaculum. 3. A pod. 4. A legumen. 5. A nut. 6. A drupe. 7. An apple. 8. A berry. 9. A strobilus. See CAPSULE, &c.

PERICHORUS, in antiquity, a name given by the Greeks to their profane games and combats, that is, to such as were

were not consecrated to any of the Gods. See the article GAMES.

PERICRANIUM, in anatomy, a thick solid coat, or membrane, covering the outside of the cranium or skull. See the article SKULL.

Some call it by the general name of periosteum, because of its adhering to the bone: others divide it into two membranes, the under one whereof immediately investing the skull they call periosteum, and the upper pericranium. In effect it is one double membrane, consisting, as most others do, of two coats. It is supposed to have its origin from the dura mater, which passing through the sutures of the skull, by means of several filaments, forms this thick membrane; at least it is found connected to the dura mater, by fibres transmitted from it to the membrane thro' the sutures. About the origin of the temporal muscles, the coats of the pericranium part; the outer passing over those muscles, and the inner still adhering close to the cranium. See the article PERIOSTEUM.

PERIDROME, *peridromus*, in antient architecture, the space, gallery, alley, or the like, in a periptere, between the columns and the wall.

PERIGEE, *perigæum*, in astronomy, that point of the sun's or moon's orbit, wherein they are at their least distance from the earth, in which sense it stands opposed to apogee. See the article APOGEE.

In the antient astronomy, perigee denotes that point in a planet's orbit, wherein the center of its epicycle is at the least distance from the earth. See the article PTOLEMAIC SYSTEM.

PERIGRAPHE, a word usually understood to express a careless or inaccurate delineation of any thing; but in Vesalius it is used to express the white lines or impressions that appear in the musculus rectus of the abdomen.

PERIGUEUX, a city of France, in the province of Guienne, capital of the territory of Perigord, situated on the river Lisle, in east long. 25′, north lat. 45° 15′.

PERIHELIUM, in astronomy, that point of a planet's or comet's orbit, wherein it is in its least distance from the sun; in which sense it stands in opposition to aphelium. See the article APHELIUM.

The antient astronomers, on account of their supposing the earth in the center of the system, instead of this term used that of perigæum. See the article PERIGEE.

PERIMETER, in geometry, the bounds or limits of any figure or body. See the article FIGURE.

The perimeter of surfaces or figures are lines, those of bodies are surfaces. In circular figures, instead of perimeter, we say circumference, or periphery. See the article CIRCUMFERENCE.

PERINÆUM, or PERINEUM, in anatomy, the space between the anus and the parts of generation, divided into two equal lateral divisions, by a very distinct line, which is longer in males than in females. The perinæum is subject to laceration in a difficult birth. In this part an operation is performed, called a puncture of the perinæum, or perforation made into the urethra and bladder, to discharge the urine when it is suppressed. See the articles DELIVERY, ISCHURY, PARACENTESIS, and PUNCTURE.

But the principal disorders to which this part is subject, are abscesses and fistulas. See the articles ABSCESS and FISTULA.

PERINDE VALERE, a term in the ecclesiastical law, signifying a dispensation to a clerk, who, being deficient in his capacity, is nevertheless de facto admitted to a benefice, or other ecclesiastical function.

PERIOCHA, περιοχη, an argument indicating the sum of a discourse.

PERIOD, in astronomy, the time taken up by a star or planet in making a revolution round the sun; or the duration of its course till it return to the same point of its orbit. See the article ORBIT.

The periodical times of the planets round the sun are as follow:

The period of	days.	hours.	min.	seconds
Mercury —	87	23	15	53
Venus — —	224	16	49	24
The earth —	365	6	9	14
Mars — —	686	23	27	30
Jupiter —	4332	12	20	25
Saturn — —	10759	6	36	26

See MERCURY, VENUS, &c.

There is a wonderful harmony between the distances of the planets from the sun, and their periods round him; the great law whereof is, that the squares of the periodical times of the primary planets, are to each other as the cubes of their distances from the sun; and likewise, the squares of the periodical times of the secondaries of any planet, are to each other as the cubes of their distances from that primary. This harmony among the planets is one of the greatest confirmations of

of the copernican hypothesis. See the article COPERNICAN.

For the periods of the moon and satellites of jupiter and saturn, see the articles MOON and SATELLITE.

The periods of several comets are now pretty well ascertained. See COMET.

PERIOD, in chronology, denotes a revolution of a certain number of years, or a series of years, whereby, in different nations, and on different occasions, time is measured; such are the following.

Calippic PERIOD, a system of seventy-six years. See CALIPPIC PERIOD.

The calippic period comprehends 48 common years, and 28 intercalary ones, 940 lunations, and 22759 days. See the article CYCLE.

Constantinopolitan PERIOD. See the article JULIAN PERIOD.

Dionysian PERIOD, or *Victorian* PERIOD, a system of 532 lunæ-solar and julian years, which being elapsed, the characters of the moon fall again upon the same day and feria, and revolve in the same order, according to the opinion of the antients.

This period is otherwise called the great paschal cycle, because the christian church first used it, to find the true time of the pascha, or easter. The sum of these years arise by multiplying together the cycles of the sun and moon. See the article EASTER.

Hipparchus's PERIOD, a system of 304 years, both lunar and solar, which being elapsed, Hipparchus thought that the reckoning by the lunar motion would coincide again with the solar measures. This period comprehends 3760 lunar months, or 111039 days; the sum of which arises from the multiplication of the calippic period by 4, subtracting unity from the product.

Julian PERIOD. See JULIAN.

Metonic PERIOD, that invented by Meton, being the same with the cycle of the moon. See the article CYCLE.

PERIOD, in grammar, denotes a small compass of discourse, containing a perfect sentence, and distinguished at the end by a point, or full stop, thus (.); and its members or divisions marked by commas, colons, &c. See the articles POINT and SENTENCE.

The celebrated definition of Aristotle is, that a period is a discourse which has a beginning, a middle, and an end, all visible at one view. And De Colonia defines a period a short but perfect sentence, consisting of certain parts or members, depending one upon another, and connected together by some common vinculum.

The periods allowed in oratory are three, a period of two members, called by the Greeks dicolos, and by the Latins bimembris; a period of three members, tricolos, trimembris; and a period of four, tetracolos, quadrimembris: however, it is possible to introduce a period of one member, called by Aristotle monocolos, or simple period; but it will be reputed a flaw, and is a thing never practised by orators. The period may likewise be prolonged to five or six members; but then it changes its name, and instead of period commences what they call a periodical discourse. The laws and measures of periods are pretty strictly regarded by orators, particularly the antients. In oratory, the members of a period should be equal, or nearly so, that the pauses, or rests of the voice, at the close of each member, may be nearly equal; however, in writing not intended for rehearsal, this is not regarded; and common discourse admits of periods, both longer and shorter than oratory.

Periods are said to be round or square, according to their different œconomy and cadences: square period is that consisting of three or four equal members, formally distinguished from each other; and a round period is that whose members or parts are so connected and fitted into each other, as that the junctures or commissures are scarce seen, but the whole sides equally round, without any notable stops or inequalities.

PERIOD is also used for the character (.) wherewith the periods of discourse are terminated, or expressed, being commonly called a full stop or point. See the article PUNCTUATION.

PERIOD, in numbers, a distinction made by a point, or comma, after every sixth place or figure; and is used in numeration for the readier distinguishing and naming the several figures or places, which see under NUMERATION.

PERIOD *of a disease*, in medicine, is the time between the access of one fit, or paroxysm, and that of the next, including the entire exacerbation, decline, and intermission, or remission. These, in some disorders, are very regular and constant, as in intermitting fevers; but in chro-

nical diforders, more irregular and uncertain, as in epilepfies: hence fuch difeafes are called periodical.

Period *of the blood*, is its circulation. See the article Circulation.

PERIODEUTA, a church-officer among the Greeks, eftablifhed by the council of Laodicea, in towns where there were no bifhops; being a kind of rural dean.

PERIODIC, or Periodical, fomething that terminates and comprehends a period: fuch is a periodic month, being the fpace of time wherein the moon difpatches her period; a periodic difeafe, *&c.* See Month, Disease, Period, *&c.*

PERIOECI, περιοικοι, in geography, fuch inhabitants of the earth, as have the fame latitudes, but oppofite longitudes; or live under the fame parallel, and the fame meridian, but in different femicircles of that meridian, or in oppofite points of the parallel. Thefe have the fame common feafons throughout the year, and the fame phænomena of the heavenly bodies; but when it is noonday with the one, it is midnight with the other, there being twelve hours between them in an eaft or weft direction. Thefe are found on the globe, by the hour-index, or by turning the globe half round, that is 180 degrees either way. See the article Globe.

PERIOPHTHALMIUM, in natural hiftory, the fame with the nictitating membrane. See the article Nictitating membrane.

PERIOSTEUM, or Periostium, in anatomy, a nervous vafculous membrane, endued with a very quick fenfe, immediately furrounding, in every part, both the internal and external furfaces of all the bones in the body, excepting only fo much of the teeth as ftand above the gums, and the peculiar places on the bones, in which the mufcles are inferted. It is hence divided into the external and internal periofteum, and where it externally furrounds the bones of the fkull, it is generally called the pericranium. See the article Pericranium.

This membrane ferves to conftitute the firft rudiments of the bones in a fœtus in utero. It is the organ of fecretion for the bony matter, as the membrana adipofa is for the fat: all the bones, during the time of their growth, receiving from it their matter of accretion, and afterwards their nutriment. The blood-veffels of the periofteum penetrate in innumerable places into the bones themfelves, as is evidently feen in the frefh bones of children. The fenfibility in the bones is wholly owing to this membrane; for when diverted of this, they may be fawed, cut, or burnt without pain. It gives the determination and figure to bones, as is evident from this, that when it is wounded, exoftofes, tophi, and caries arife in the part. The periofteum is of different thicknefs in different parts, but in general the internal is vaftly thinner than the external, and ferves to nourifh that part of the bones. It receives alfo nerves and blood-veffels from the outfide, through certain canals in the fubftance of the bones, which it communicates to the marrow in fuch as have any. It is generally faid to arife from the dura mater of the brain; but Heifter thinks this opinion fcarce right, as the periofteum is evidently formed at the fame time with the dura mater in the fœtus.

PERIPATETIC philosophy, that fyftem taught and eftablifhed by Ariftotle, and maintained by his followers, the peripatetics, called alfo ariftotelians.

The greateft and beft part of Ariftotle's philofophy, he is faid to have borrowed from his mafter Plato. Serranus affirms confidently, and fays that he is able to demonftrate it, that there is nothing exquifite in any part of Ariftotle's philofophy, dialectics, ethics, politics, phyfics, or metaphyfics, but is found in Plato: and of this opinion are many of the antient authors, Clemens Alexandrinus, *&c.* Ariftotle's philofophy preferved itfelf *in puris naturalibus*, a long time, none of his followers or commentators having dared to make any innovation therein, till the beginning of the XIIIth century, when it began to be new modelled. A reformed fyftem of peripateticifm was firft introduced into the fchools in the univerfity of Paris, from whence it foon fpread throughout Europe, and has fubfifted in the univerfities to this day, under the name of fchool philofophy; the foundation whereof is Ariftotle's doctrine frequently mifunderftood, and oftner mifapplied: but of thefe, at different times, have fprung feveral branches, as the thomifts, fcotifts, nominalifts, *&c.* See the article Thomists, *&c.*

PERIPETIA, περιπέτεια, in the drama, that part of a tragedy, wherein the action is turned, the plot unravelled, and the whole concludes. See the article Catastrophe.

The qualities of the peripetia are, that it be

be probable and neceffary; in order to which it muft be the natural refult, at leaft the effect of the foregoing action, or of the fubject itfelf, and muft not ftart from any foreign or collateral caufe. The peripetia is fometimes induced by remembrance or difcovery, and fometimes without any difcovery.

PERIPHERY, in geometry, the circumference of a circle, ellipfes, or any other regular curvilinear figure. See the article CIRCUMFERENCE, CIRCLE, &c.

PERIPHRASIS, in rhetoric, the fame with circumlocution. See the article CIRCUMLOCUTION.

PERIPLOCA, CLIMBING DOG'S BANE, in botany, a genus of the pentandria-digynia clafs of plants, the corolla whereof confifts of a fingle plane petal, divided into five oblong, linear, truncated, and emarginated fegments; the fruit confifts of two large, oblong, ventricofe follicles, each formed of a fingle valve, and containing one cell: the feeds are numerous, imbricated, and coronated with down; the receptacle is longitudinal and capillary.

PERIPNEUMONY, in medicine, an inflammation of the lungs attended with a weight in the lungs, a difficulty of breathing, and an oppreffion of the breaft, with a purulent fpitting, and a fever accompanied with a cough. When the inflammation affects both the lobes, and the whole body of the lungs, the cafe is defperate.

The peripneumony is diftinguifhed into two kinds; one of which has its feat at the extremity of the pulmonary artery, and is called the true peripneumony; and the other is fituated in the bronchial arteries, and is called the fpurious or baftard peripneumony.

The true peripneumony is often cured by a critical refolution and concoction of the morbific matter, which is either attenuated, fo as to be returned into the channels in the common courfe of circulation, or expectorated by coughing; which may be eafily known by an abatement of the fymptoms, and the patient's falling into gentle breathing fweats.

Copious bleeding is the moft effectual remedy in the beginning of this difeafe; but not fo proper when expectoration goes on fuccefsfully, becaufe it fometimes fuppreffes it, and in that cafe fudorifics thicken the matter which is expectorated. The motions of nature ought to be followed: the aliment ought to be more flender and thin than in any other inflammatory difeafe whatfoever; common whey is fufficient to preferve the ftrength of the patient; relaxing aliments are proper, of which barley, and all its preparations, are the beft. Diuretics that have not much acrimony are ufeful; and for this intention, an infufion of fennel-roots in warm water, with milk, is good. If nature relieves by a diarrhœa, without finking the ftrength of the patient, it ought to be promoted by emollient clyfters. But if the patient is neither relieved nor dies in eight days, the inflammation will end in a fuppuration, and an abfcefs of the lungs, and fometimes in fome other part of the body: in this cafe bleeding muft be forborne; the diet muft be mild, foft, incraffating, and more plentiful; and tepid vapours fhould be taken into the lungs, from decoctions of proper ingredients. When, by the fymptoms and time, the impofthume may be judged to be ripe, the vapour of vinegar, and any thing that creates a cough, are proper; for the fooner it is broke, the lefs danger will the lungs be in. In this ftate, which is not abfolutely defperate, the aliment ought to be milk, and the drink milk and barley-water with gentle anodynes, that the patient may have fome reft.

Spurious, or *Baftard* PERIPNEUMONY, a difeafe of the lungs, which generally arifes from a heavy pituitous matter generated in the blood, and caft upon the lungs. In this diforder the patient is hot and cold by turns, is giddy upon the leaft motion, and complains of a rending pain of the head whenever he coughs; he vomits up every thing that he drinks; the urine is turbid and red, and the whole thorax full of pain. In this diforder the patient fhould be let blood from a large orifice; and then give him the following clyfter, which muft be repeated daily, till the fymptoms evince that the lungs are relieved: take of honey, three ounces; of nitre, one dram; one yolk of an egg; and eight ounces of barley-water; make them into a clyfter. Let the patient's diet be very flender, fuch as weak broths, fharpened a little with orange or lemon-juice; and he may drink a weak mixture of honey and water: the fteams of warm water may be taken in at the mouth, and the following decoction given him: take of the roots of fennel, two ounces; of the roots of grafs, four ounces; of the leaves of pellitory,

 and

and agrimony, each an handful and a half; of the bruifed feeds of white poppy, one ounce; and of liquorice, one ounce and an half; boil them, for a quarter of an hour, in two pints and a half of water: of which let the patient drink two ounces every two hours. Likewife let his legs and feet be bathed, and large blifters applied.

PERIPTERE, in the antient architecture, a building encompaffed on the outfide with a feries of infulated columns, forming a kind of portico all around; fuch were the portico of Pompey, the feptizon of Severus, and the bafilica of Antoninus.

The peripteres were properly temples, which had columns on all the four fides, by which they were diftinguifhed from the proftyle and amphiproftyle, the laft of which had no columns before, and the firft none on the fides.

M. Perault obferves, that periptere, in the general fenfe of the word, is the name of a genus, including all the fpecies of temples, which have porticos of columns all around, whether the columns be diptere, or pfeudo-diptere, or fimply periptere, which is a fpecies that bears the name of a genus, and which has its columns diftant from the wall, the breadth of an intercolumnation.

PERISCII, in geography, the inhabitants of either frigid zone, between the polar circles and the poles; where the fun, when in the fummer figns, moves only round about them, without fetting, and confequently their fhadows, in the fame day, turn to all the points of the horizon.

PERISKYTISM, in antient furgery, an incifion made under the coronal future, reaching from one temple acrofs to the other, penetrating to the bone of the cranium.

PERISTALTIC, in medicine, a vermicular fpontaneous motion of the inteftines, performed by the contraction of the circular and longitudinal fibres, of which the flefhy coats of the inteftines is compofed; by means whereof the chyle is driven into the orifices of the lacteal veins, and the fæces are protruded towards the anus. See CHYLIFICATION.

When this motion comes to be depraved, and its direction changed, fo as to proceed from below upwards, it produces what is called the iliac paffion. See the article ILIAC PASSION.

PERISTAPHYLINUS, in anatomy, a name which fome give to a mufcle of the uvula, more properly denominated pterygoftaphylinus. See the articles UVULA and PTERYGOIDÆUS.

PERISTYLE, in antient architecture, a building encompaffed with a row of columns on the infide: fuch was the hypæthre temple of Vitruvius, and fuch are now fome bafilicas in Rome, feveral palaces in Italy, and moft cloifters of religious.

Periftyle is alfo ufed by modern writers, for a range of columns, either within or without a building: thus we fay, the corinthian periftyle of the portal of the Louvre, *&c.*

PERISYSTOLE, in medicine, the interval of reft between the two motions of the heart, *viz.* that of the fyftole, or contraction, and that of the diaftole, or dilatation.

PERITONÆUM, in anatomy, is a thin, fmooth, and lubricous membrane, invefting the whole internal furface of the abdomen, and containing moft of the vifcera of that part, as it were in a bag. It lies immediately under the tranfverfe mufcles of the abdomen, and adheres to them, and alfo coheres with the diaphragm, and with all the vifcera lodged in this part. It entirely inclofes the ftomach, the inteftines, the mefentery, the omentum, the liver, the fpleen, and the pancreas: as to the kidneys, ureters, and fmaller veffels of the abdomen, it covers them only on the anterior part, and the urinary bladder only on the pofterior.

The peritonæum is compofed of a double membrane, or lamella; the exterior one has longitudinal and flender fibres, and the interior tranfverfe and more robuft ones. There are alfo ligaments formed from it, *viz.* that which fufpends the liver, and the two ligamenta lata of the uterus in women. Its proceffes, fent out of the abdomen, are two, and thefe ferve to furround and inclofe the fpermatic veffels and the tefticles.

The arteries and veins of the peritonæum are fupplied from the epigaftric, mammary, lumbar, and diaphragmatic veffels; and the nerves are propagated from thofe of the diaphragm, back, loins, and os facrum.

The ufe of the peritonæum are, 1. To inclofe the contents of the abdomen; for when this part is dilated, wounded, or broken, they fall out of their due places, and ruptures are formed. 2. To give an external covering to almoft all the parts

parts contained in the abdomen, which are therefore generally ſaid to have their external membrane from the peritonæum. And, 3. To form the proceſs of the peritonæum, and the tunica vaginalis of the teſtes.

PERITROCHIUM, in mechanics, denotes a wheel, or circle, concentric with the baſe of a cylinder, and moveable together with it, about an axis. See the article AXIS IN PERITROCHIO.

PERJURY, in law, the crime of ſwearing falſely, where a lawful oath is adminiſtered by one in authority, in a matter relating to the iſſue or cauſe in queſtion, whether it be a perſon's own wilful act, or done by the ſubornation of others. See OATH and SUBORNATION.

In order to make an offence perjury, it muſt appear to be wilful and deliberate, and not done through ſurprize or inadvertency: it muſt be direct and poſitive, and not where a perſon ſwears as he thinks or believes: but in caſe a perſon ſwears to what he is ignorant of, it is a falſe oath, even though what he ſwears ſhould happen to be true; thus, a plaintiff cauſed two perſons to ſwear to the value of goods, which they never ſaw, when, notwithſtanding they ſwore what was true, it was adjudged to be perjury in them. At the common law, perjury, and the ſubornation of it, are puniſhable by fine, impriſonment, pillory, tranſportation, &c. Perſons committing perjury in a cauſe concerning lands, goods, &c. depending in a court of record, ſhall forfeit 20 l. be impriſoned for ſix months, and be rendered incapable of giving evidence in any court, till the judgment is reverſed; and if offenders have not goods to the value of the fine, they are to be ſet in the pillory, in ſome market-place, and have their ears nailed thereto. When a perſon ſuborns a witneſs to give falſe teſtimony in a court of record, he forfeits 40 l. and if he be not worth ſo much, ſhall ſuffer ſix months impriſonment, and ſtand in the pillory, &c.

PERIWINKLE, in the hiſtory of ſhell-fiſh, a ſpecies of buccinum. See the article BUCCINUM.

PERMANENT, in general, ſomething that continues the ſame, whether in nature or ſituation, and other circumſtances: thus, air generated by fermentation, is ſaid to be permanent, becauſe it continues to ſhew all the natural properties of common air. See AIR.

Thus alſo thoſe cups of flowers are called permanent, which remain after the flower-leaves are fallen.

PERMEABLE, a term applied to bodies of ſo looſe and porous a ſtructure, as to let ſomething paſs through them.

PERMIA, a province on the north-eaſt part of european Muſcovy, ſeparated from Aſia by the river Oby.

PERMUTATION, in commerce, the ſame with bartering. See BARTERING.

In the canon-law, permutation denotes the actual exchange of one benefice for another.

PERMUTATION *of quantities*, in algebra, the ſame with combination. See the article COMBINATION.

PERNAMBUCO, a province of Braſil, in America, bounded by the province of Tamera on the north, by the Atlantic ocean on the eaſt, by the province of Seregippa on the ſouth, and by the country of the Tapuyers on the weſt; being two hundred miles long, and one hundred and fifty broad.

PERNANCY, in law, ſignifying taking or receiving, is peculiarly applied to tithes taken in kind. See PERNOR.

PERNES, a town of the french Netherlands, of the province of Artois, ſituated fifteen miles ſouth-eaſt of St. Omers.

PERNIONES, CHILBLAINS, or KIBES, in ſurgery, a name given to thoſe tumours, which happen in the hands and feet from violent cold. See the article COLD.

Chilblains are accompanied with inflammation, heat, redneſs, pricking pain, and immobility of that limb: ſometimes they are of a livid or leaden colour, and ſometimes they break out with ſcabs, or elſe with chops, or ſlits, which afterwards penetrate deeper, and become ulcerous. The humour which they diſcharge is a little fœtid, and pretty much reſembles pus or ſanies; and they terminate in either diſperſion, ſuppuration, or gangrene and ſphacelus. See the article DISPERSION, &c.

While the chilblains are yet tumified and red, and the part retains its ſenſe and motion, without any great heat and pain, the diſorder is then of the mildeſt kind; on the contrary, when they are livid, occaſion the limb to become ſtiff and inſenſible, or excite pricking pains therein, there is then danger of a worſe conſequence, leſt it ſhould degenerate into a gangrene, or at leaſt a deep exulceration. There being no room to doubt but that cold is the cauſe of chilblains, it readily follows that the cure muſt conſiſt chiefly

in reſtoring the blood to its former fluidity and free circulation as ſoon as poſſible; for which purpoſe an external as well as internal treatment is neceſſary. In the external treatment, the patient being expoſed in a temperate air, ſhould according to Heiſter, exerciſe his limbs as much as poſſible, in order to advance him ſtill to a greater warmth or heat; but when he is too weak to exerciſe himſelf, it will be proper to bath the parts affected with ſnow, or cold water; after which, when the limb becomes ſenſible, comfortable medicines may be applied, ſuch as ſpirit of wine, either pure, or with theriaca, rock-oil, balſam of ſulphur, &c. When the parts affected have been well rubbed or bathed with theſe, the patient may then be advanced towards the fire, or be put to bed, endeavouring afterwards to excite a gentle ſweat.

In the internal treatment, great ſervice will be had from a few glaſſes of hot wine, wherein has been boiled ſome cinnamon and ſugar; though it may not be improper to give with this alternately, a ſmall quantity of ſome ſudorific mixture. If the wine be not at hand, good ale boiled with cinnamon, cloves, and ſugar, may well enough ſupply its place. It ſhould be continued ſo as to keep up a ſweat for a whole hour, for half an hour, or according to the ſeveral circumſtances: but if the diſorder is much ſlighter, this method is not then ſo directly neceſſary; it may then be laid aſide: though, in the opinion of Heiſter, it is much preferable to any other method. When chilblains tend to a ſuppuration, then it is proper to treat them like other abſceſſes. See the article ABSCESS.

If a patient has before been troubled with chilblains, which are uſed to return every year in the winter, the preſervative againſt the diſorder is to anoint the parts affected with petroleum, or oil of turpentine, before and after the ſeverity of the winter comes on; but when the diſorder has begun to ſhew itſelf again by tumour, inflammation, and pain, the heel or finger may be wrapped up in a ſwine's bladder, dipped in the forementioned oil, and the cold itſelf ſhould always be carefully avoided by proper cloths or coverings.

PERNOR *of profits*, in law, he who takes the profits of lands, &c. and on ſeiſure, the king ſhall have the lands of an outlawed perſon, and the profits thereof, notwithſtanding they are aliened by the outlaw.

PERONE, in anatomy, the ſame with fibula. See FIBULA. Hence,

PERONÆUS, in anatomy, is an epithet applied to ſome of the muſcles of the perone or fibula. 1. The peronæus anticus, is a muſcle that ariſes at the anterior part of the middle of the fibula, and terminates at the exterior metatarſal bone; the office of this muſcle is to draw the foot upwards. 2. Peronæus poſticus is a muſcle that ariſes at the upper part of the fibula, but its tendon is turned back under the tarſus, and is inſerted into that bone of the metatarſus, which ſupports the great toe. There is uſually in old ſubjects a ſeſamoide bone in the tendon of this muſcle, where it paſſes under the os cuboides. Its office is alſo to pull the foot upwards. See MUSCLE.

PERONNE, a city of France, in the province of Picardy, ſituated on the river Somme, twenty-three miles north eaſt of Amiens.

PERORATION, *peroratio*, in rhetoric, the epilogue, or laſt part of an oration, wherein what the orator had inſiſted on through his whole diſcourſe, is urged afreſh with greater vehemence and paſſion. The peroration conſiſts of two parts. 1. Recapitulation, wherein the ſubſtance of what was diffuſed throughout the whole ſpeech is collected briefly, and curſorily, and ſummed up with new force and weight. 2. The moving the paſſions, which is ſo peculiar to the peroration, that the maſters of the art call this part ſedes affectuum. The paſſions to be raiſed are various, according to the various kinds of oration. In a panegyric, love, admiration, emulation, joy, &c. In an invective, hatred, contempt, &c. In a deliberation, hope, confidence, or fear. The qualities required in the peroration are, that it be very vehement and paſſionate, and that it be ſhort; becauſe, as Cicero obſerves, tears ſoon dry up.

PEROUSA, a town of Italy, in the province of Piedmont, capital of one of the vallies of the Vaudois, ſituated twelve miles ſouth-weſt of Turin.

PERPENDICULAR, in geometry, a line falling directly on another line, ſo as to make equal angles, on each ſide; called alſo a normal line: thus the line AB, plate CXCVII. fig. 2. n° 1. is perpendicular to the line CD. *i. e.* it makes right

right angles therewith. See Angle. From the very notion of a perpendicular it follows; 1. That the perpendicularity is mutual, *i. e.* if a line, as A B, be perpendicular to another C D, that other is alſo perpendicular to the firſt. 2. That only one perpendicular can be drawn from one point in the ſame place. 3. That if a perpendicular be continued through the line it was drawn perpendicularly to, the continuation will alſo be perpendicular to the ſame. 4. That if there be two points of a right line, each of which is at an equal diſtance from two points of another right line, that line is perpendicular to the other. 5. That line which is perpendicular to another is alſo perpendicular to all the parallels of the other. 6. That a perpendicular line is the ſhorteſt of all thoſe which can be drawn from the ſame point to the ſame right line.

Hence, the ſhorteſt diſtance of a point from a line is a right line drawn from the point perpendicular to the line, or plane; and hence the altitude of a figure is a perpendicular let fall from the vertex to the baſe.

To raiſe, from the point A, (*ibid.* n° 2.) a line perpendicular to the line B C; make AB=A C and from the points B and C as centers, with the ſame opening of the compaſſes, deſcribe two arches cutting each other in the point D, and the line D A ſhall be the perpendicular required; that is, the angles D A B, D A C, ſhall be equal; becauſe all the ſides of the triangle D A B will be equal to all the ſides of the triangle D A C.

To let fall a perpendicular upon a line B C (*ib.* n° 3.) from a point given without it A; on the point A deſcribe an arch which ſhall cut the line in the points B and C: then making the equilateral triangle B E C (by prop. 1. lib. i. of Euclid) the line A E ſhall be perpendicular to the line B C. For ſince the triangles A B D and A C D have the ſide A D common, and A B is equal to A C, and the angle B A D is equal to the angle C A D, they are equal in every reſpect by prop. 4. lib. 1. of Euclid; and the angle D equal on each ſide: therefore by the definition the line A D is perpendicular to the line B C.

To erect a perpendicular on the end of a given line, ſuppoſe at R, (*ibid.* n° 4.) open your compaſſes to any convenient diſtance; and ſetting one foot in C, draw the ſemi-circle P R S. Lay a ruler from S thro' C, and it will find the point P in the circumference: whence draw P R, which is the perpendicular required. For the angle P R S being in a ſemi-circle muſt be a right one by prop. 31. lib. iii. of Euclid, and conſequently P R muſt be perpendicular to S R.

A line is ſaid to be perpendicular to a plane when it is perpendicular to more than two lines drawn in that plane; and a plane is ſaid to be perpendicular to another plane, when a line in one plane is perpendicular to the other plane.

Perpendicular *to a parabola* is a right line cutting the parabola in the point in which any other right line touches it, and is alſo itſelf perpendicular to that tangent.

PERPENDICULARITY *of plants*, in natural hiſtory, a quality obſerved in all plants, which though they riſe a little crooked, yet the ſtems ſhoot up, and the roots ſink down, as much as poſſible in a perpendicular direction. This curious phænomenon was firſt obſerved by M. Dodart, who publiſhed an expreſs eſſay on the affectation of perpendicularity obſerved in the ſtems or ſtalks of all plants, in the roots of many, and even in their branches. He obſerves, that ſuch plants, or parts of plants, as by the declivity of the ſoil come out inclined, or ſuch as are diverted out of the perpendicular by any violent means, again redreſs and ſtraighten themſelves, and recover their perpendicularity by making a ſecond or contrary bend or elbow without rectifying the firſt.

PERPETUAL, ſomething that endures always, or laſts for ever.

It is ſometimes alſo uſed for a thing that laſts or holds during a perſon's life: thus offices, &c. held durante vita, are ſometimes called perpetual offices.

Perpetual glands, in anatomy, are thoſe which are natural, thus diſtinguiſhed from the adventitious ones.

Perpetual motion, or Movement. See the article Movement.

Perpetual occultation. See the articles Occultation.

PERPETUITY, in law, is when an eſtate is intended to be ſo ſettled in tail, &c. that it may not poſſibly be undone, or made void.

This is a thing the law will not ſuffer, on which account all perpetuities are avoided: for example, an eſtate cannot be made to deprive a tenant in tail, either by condition or limitation, of the power

of alienation by fine and recovery, &c. and a term for years may not be devifed to one and the heirs of his body, as an eftate-tail with remainders over, to create a perpetuity, though it may be affigned to truftees for the iffue in tail to receive the profits, &c.

Perpetuity, in the canon law, is the quality of a benefice that is irrevocable, or whofe incumbent cannot be deprived; except in certain cafes, determined by law.

PERPIGNAN, a city of Spain, in the province of Catalonia, capital of the territory of Rouffillon, fituated on the river Latet, in eaft long. 2° 35′, north lat. 43°.

PER QUÆ SERVITIA, a judicial writ, which iffues on the note of a fine, and lies for the cognifee of a manor, lands, rents, or other fervices, to compel the tenants thereof at the time of the fine levied to attorn to him. See COGNISEE.

PERQUISITE, in law, is any thing gotten by a man's own induftry, or purchafed with his money; in contradiftinction to what defcends to him, from his father or other anceftor.

PERQUISITES *of courts*, are the profits which cafually accrue to a lord of the manor from his courts-baron, by fines for copyholds, efcheats, heriots, amercements, &c.

PERRIWIG, or PERRUKE. See the article PERRUKE.

PERRON, in architecture, the fteps in the front of a building, raifed before the doors of great houfes, and leading to the firft ftory, when raifed above the level of the ground.

Perrons are made of different forms and fizes according to the fpace and height they are to lead to: fometimes the fteps are round, or oval, but more ufually they are fquare. Where a perron is thirteen or fifteen fteps high, their range ought to be interrupted by one or two landing places, that there may not be too many fteps to mount fucceffively, and that the eye may not be difpleafed by viewing fo great a height without refts. A perron fhould always be confined to the height of the zocle, or foot of the whole building.

PERROQUET, or PARROQUET. See the article PARROQUET.

PERRUKE, or PERRIWIG, was antiently ufed for a head of long natural hair, particularly fuch as was curled and adjufted with great care. But it is now ufed for a fet of borrowed hair, curled, baked, interwoven between four threads, and fewed together on a cawl.

It is doubted whether the ufe of perrukes was known among the antients. It is true, they ufed falfe hair; but this feems to have had fcarce any thing in common with our perrukes, and was at beft only compofed of hair glued together. Nothing can be more ridiculous than the defcription Lampridius gives of the emperor Commodus's perruke, which was greafed with glutinous perfumes, and powdered with fcrapings of gold. In reality, the ufe of perrukes, at leaft on their prefent footing, is not much above a hundred years old: the year 1629, is reckoned the epocha of long perrukes; at which time they began to appear at Paris, from whence they fpread by degrees through the reft of Europe.

PERRY, a drink made of pears, in the fame manner as cyder is made from apples. See the article CYDER.

The pears muft be perfectly ripe, and to give the liquor a greater degree of tartnefs, fome mix crabs with them. The beft fruit for making perry, is fuch as is leaft fit for eating, as the choak-pear, boreland-pear, horfe-pear, and the barbery-pear.

PER SE, in the fchools, is fometimes oppofed to per accidens; in which fenfe, a thing is faid to agree with another per fe, when the agreement is not owing to any accidental event, but is found in the intrinfic principles of things themfelves. It is fometimes oppofed to per aliud; in which fenfe, God alone is faid to have a being per fe, as not deriving it from any other, but having it neceffarily and of himfelf. Per fe again fignifies as much as of its own nature, or by virtue of its own entity: thus, the fun is faid to give light per fe, and thus quantity is extended per fe.

Among logicians a thing is faid to be known per fe, *per fe notum*, when we immediately perceive it upon the firft propofing of the terms, as that the whole is greater than any one of its parts. Philofophers go fo far as to confider the mode of a thing exifting per fe, or that which conftitutes its exiftence fuch, which they call perfeity, or perfeitas.

Among chemifts, when a body is diftilled fingly, and without the ufual addition of any other matter to raife it, it is faid to be diftilled per fe.

PERSECUTION, is any pain or affliction which

which a perſon deſignedly inflicts upon another; and, in a more reſtrained ſenſe, the ſufferings of chriſtians on account of their religion.

Hiſtorians uſually reckon ten general perſecutions, the firſt of which was under the emperor Nero, thirty one years after our lord's aſcenſion; when that emperor having ſet fire to the city of Rome, threw the odium of that execrable action on the chriſtians, who under that pretence were wrapped up in the ſkins of wild beaſts, and worried and devoured by dogs; others were crucified, and others burnt alive. The ſecond was under Domitian, in the year 95. In this perſecution St. John the apoſtle was ſent to the iſle of Patmos, in order to be employed in digging in the mines. The third began in the third year of Trajan, in the year 100, and was carried on with great violence for ſeveral years. The fourth was under Antoninus the philoſopher, when the chriſtians were baniſhed from their houſes, forbidden to ſhew their heads, reproached, beaten, hurried, from place to place, plundered, impriſoned and ſtoned. The fifth, began in the year 197, under the emperor Severus. The ſixth, began with the reign of the emperor Maximinus in 235. The ſeventh, which was the moſt dreadful perſecution that had ever been known in the church, began in the year 250, in the reign of the emperor Decius, when the chriſtians were in all places driven from their habitations, ſtripped of their eſtates, tormented with racks, &c. The eighth began in the year 257, in the fourth year of the reign of the emperor Valerian. The ninth was under the emperor Aurelian A. D. 274, but this was very inconſiderable: and the tenth began in the nineteenth year of Diocleſian, A. D. 303. In this dreadful perſecution, which laſted ten years, houſes filled with chriſtians were ſet on fire, and whole droves were tied together with ropes, and thrown into the ſea.

PERSEES, the ſame with gaurs. See the article GAURS.

PERSEPOLIS, formerly a city of Perſia, but now in ruins. Here are the moſt magnificent remains of a palace, or temple, that are now in being on the face of the earth: eaſt long. 54°, north lat. 30° 30′.

PERSEVERANCE, in theology, a chriſtian virtue, by which we are enabled to perſiſt in the way of ſalvation to the end.

The final perſeverance of the ſaints is a doctrine much controverted between the arminians and calviniſts; the latter of whom maintain, that it is impoſſible for grace to be loſt, and conſequently make perſeverance to the end a neceſſary conſequence thereof; while the others imagine, that the moſt confirmed believers are never out of a poſſibility of falling.

PERSEUS, in aſtronomy, a conſtellation of the northern hemiſphere, which, according to the catalogues of Ptolemy and Tycho, contains twenty-nine ſtars; but in the britannic catalogue, ſixty-ſeven.

PERSHORE, a market-town of Worceſterſhire, ten miles ſouth-eaſt of Worceſter.

PERSIA, a large kingdom of Aſia, 1200 miles long, and almoſt as much broad; ſituated between 45° and 67° of eaſt longitude, and between 25° and 45° of north latitude; bounded by Circaſſian Tartary the Caſpian Sea, and the river Oxus on the north; by Indian, on the eaſt; by the Indian Ocean, and the gulphs of Ormus and Perſia, on the ſouth; and by the turkiſh empire on the weſt.

PERSIAN, in general, ſomething belonging to Perſia, as the Perſian empire, language, *&c.*

The perſian tongue has two peculiarities not to be met with in any other of the eaſtern languages; the one, that it has an auxiliary verb anſwering to the verb εἰμι of the greeks; the other, that it has an aoriſtus. Theſe peculiarities it borrowed from the Macedonians, after the conqueſt of Alexander.

PERSIAN-WHEEL, an engine, or wheel, turned by a rivulet, or other ſtream of water, and fitted with open boxes at its cogs, to raiſe water for the overflowing of lands, or other purpoſes. See the article OVERFLOWING.

It may be made of any ſize, according to the height the water is to be raiſed to, and the ſtrength of the ſtream by which it is turned. This wheel is placed ſo, that its bottom only is immerſed in the ſtream, wherein the open boxes at its cogs are all filled one after another with water, which is raiſed with them to the upper part of the wheel's circuit, and then naturally empties itſelf into a trough which carries it to the land.

PERSICA, the PEACH, is only a ſpecies of the amygdalus, or almond-tree. See the article AMYGDALUS.

The ſerratures of its leaves are acute;

the flowers are of a pale red; and the fruit is large and fucculent, and contains a large ftone. See plate CC. fig. 1. It is a native of Perfia, whence it got the name of malus perfica: a fyrup of its flowers is a gentle emetic.

PERSICARIA, ARSMART, in botany, a genus of the octandria trigynia clafs of plants, with a monopetalous flower, divided into five oval fegments, alternately patent and connivent: there is no pericarpium, the feed, which is fingle, and of an oval compreffed figure, being contained in the flower-petal, which is permanent.

There is great irregularity in this genus; there being in this fpecies only five ftamina; and in others fix, or eight.

The mild or fpotted arfmart is faid to be a good vulnerary and antepileptic: and the biting arfmart is a good ftimulating medicine, and diuretic: its frefh leaves are alfo ufed by farriers for cleanfing old ulcers.

PERSON, an individual fubftance of a rational or intelligent nature. Thus we fay, an embaffador reprefents the perfon of his prince; and that in law, the father and fon are reputed the fame perfon.

In theology, the godhead is divided into three perfons; but here the word perfon is defigned to convey a peculiar idea, very different from that attached to it every where elfe; it being only ufed for want of another term more pertinent and expreffive. See TRINITY.

PERSON, in dramatic poetry, the character affumed by an actor, or he who is reprefented by the player. Thus, at the head of dramatic pieces, is placed the dramatis perfonæ, or lift of the perfons that are to appear on the ftage. Father Boffu obferves, that in the epic and dramatic poem the fame perfon muft reign throughout; that is, muft fuftain the chief part through the whole piece, and the characters of all the other perfons muft be fubordinate to him. See the articles TRAGEDY, CHARACTER, &c.

PERSON, in grammar, a term applied to fuch nouns or pronouns, as being either prefixed or underftood, are the nominatives in all inflexions of a verb; or it is the agent or patient in all finite and perfonal verbs. See the article NOMINATIVE and VERB.

There are three perfons of a verb; as *I love*, is a verb ufed in the firft perfon; *thou loveft*, is the verb ufed in the fecond perfon; and *he loveth*, makes the third perfon; and thus in the plural number: the dual number of the Greeks have the fecond and third perfons dual, as, *ye two love*, *they two love*, &c. *I*, *thou*, *he*, are pronouns of the firft fecond, and third perfon fingular. *We*, *ye*, *they*, of the firft, fecond, and third perfons plural. The firft perfon is that which fpeaks, the fecond is that to whom the fpeech is directed, and the third is that whom the difcourfe concerns. In the latin and greek languages the perfon of a verb is no more than the different terminations of that verb in every tenfe.

PERSONABLE, in law, fignifies the being able to maintain a plea in court; efpecially in the plea of an alien, who may be made perfonable by act of parliament.

It is alfo ufed to fignify a capacity to receive any thing granted or given.

PERSONAL, any thing that concerns, or is reftrained to, the perfon: thus it is a maxim in ethics, that all faults are perfonal.

PERSONAL ACTION, in law, is an action levied directly and folely againft the perfon; in oppofition to a real or mixed action. See the article ACTION.

PERSONAL GOODS, or chattels, in law, fignifies any moveable thing belonging to a perfon, whether alive or dead. See the article CHATTELS.

PERSONAL TYTHES, are tythes payable out of the profits obtained by a man's perfonal labour and induftry, as in buying, felling, handicraft, &c.

PERSONAL VERB, in grammar, a verb conjugated in all the three perfons; thus called, in oppofition to an imperfonal verb, or that which has the third perfon only. See the article IMPERSONAL VERB.

PERSONALITY, in the fchools, that which conftitutes an individual or diftinct perfon.

The fchool-divines are divided about what it is, that diftinguifhes the feveral perfonalities in the Trinity; fome will have it to be only the different relations, others contend for its being fome incommunicable fubftance, and others take the perfonalities to be diftinguifhed by different origins. See TRINITY.

PERSONALITY, or PERSONALTY, in law, is fometimes ufed for perfon: thus an action is faid to be in perfonality when it is brought againft the right perfon.

PERSONATED-FLOWERS, among botanifts are flowers which refemble the

PERSPECTIVE

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9. A Reflecting PERSPECTIVE GLASS

gaping mouths of certain living creatures. See the article FLOWER.

PERSONIFYING, or PERSONALIZING, the giving an inanimate being the figure, ſentiments, and language of a perſon.

Perſonifying is eſſential to poetry, eſpecially to the epopœia: the poets have therefore perſonifyed all the paſſions, and even repreſented them as deities; as the goddeſs Perſuaſion, the god Sleep; the Furies, Envy, Diſcord, and Fame, Fortune, Victory, Sin, Death, *&c.*

PERSPECTIVE, that branch of optics, which teaches how to repreſent objects on a plane ſuperficies, ſuch as they would appear at a certain diſtance and height, upon a tranſparent plane perpendicular to the horizon, placed between the objects and the eye.

The foundation of perſpective may be thus conceived: ſuppoſe the pentagon ABDEF (plate CXCVIII. fig. 1.) were to be repreſented by the rules of perſpective on the tranſparent plane V P, placed perpendicularly on the horizontal plane H R; dotted lines are imagined to paſs from the eye C to each point of the pentagon, as C A, C B, C D, *&c.* which are ſuppoſed in their paſſage through the plane P V, to leave their traces or veſtigia in the points *a*, *b*, *d*, &c. on the plane, and thereby to delineate the pentagon *a b d e f*; which, as it ſtrikes the eye by the ſame rays that the original pentagon A B D E F does, will be a true perſpective repreſentation of it.

The buſineſs of perſpective, therefore, is to lay down geometrical rules for finding the points *a*, *b*, *d*, *e*, *f*, upon the plane; and hence, alſo, we have a mechanical method of delineating any object very accurately. See DESIGNING.

Perſpective is either employed in repreſenting the ichnographies, or ground-plots of objects; or the ſcenographies, or repreſentations of the objects themſelves. See the article ICHNOGRAPHY and SCENOGRAPHY.

But before we give any examples of either, it will be proper to explain ſome technical terms in regard to perſpective in general: and, firſt, the horizontal line is that ſuppoſed to be drawn parallel to the horizon through the eye of the ſpectator; or rather it is a line which ſeparates the heaven from the earth, and which limits the ſight. Thus, A, B, (*ibid.* fig. 2.) are two pillars below the horizontal line, C D, by reaſon the line is elevated above them; in fig. 3. they are ſaid to be equal with it; and in fig. 4. raiſed above it. Thus, according to the different points in view, the objects will be either higher or lower than the horizontal line. The point of ſight, A (*ibid.* fig. 5.) is that which makes the centrical ray on the horizontal line, *a b*; or, it is the point where all the the other viſual rays, D, D, unite. The points of diſtance, C, C, are points ſet off in the horizontal line at equal diſtances on each ſide of the point of ſight, A; and, in the ſame figure, B B repreſents the baſe line, or fundamental line; E E is the abridgement of the ſquare, of which D, D, are the ſides; F, F, the diagonal lines, which go to the points, of diſtance C, C. Accidental points, are thoſe where the objects end: theſe may be caſt negligently, becauſe neither drawn to the point or ſight, nor to thoſe of diſtance, but meeting each other in the horizontal line. For example, two pieces of ſquare timber, G and H (*ibid.* fig. 6.) make the points I, I, I, I, on the horizontal line; but go not to the point of ſight K, nor to the points of diſtance C, C: theſe accidental points ſerve likewiſe for caſements, doors, windows, tables, chairs, *&c.* The point of direct view, or of the front, is when we have the object directly before us; in which caſe, it ſhews only the foreſide; and, if below the horizon, a little of the top; but nothing of the ſides, unleſs the object be polygonous. The point of oblique view, is when we ſee an object aſide of us, and as it were aſlant, or with the corner of the eye; the eye, however, being all the while oppoſite to the point of ſight; in which caſe, we ſee the object laterally, and it preſents to us two ſides or faces. The practice is the ſame in the ſide-points, as in the front-points; a point of ſight, points of diſtance, *&c.* being laid down in the one as well as in the other.

We ſhall now give ſome examples, by which it will appear, that the whole practice of perſpective is built upon the foundation already laid down. Thus, to find the perſpective appearance of a triangle, A B C (*ibid.* fig. 7.) between the eye and the triangle, draw the line D E, which is called the fundamental line; from 2 draw 2 V, repreſenting the perpendicular diſtance of the eye above the fundamental line, be it what it will; and through V draw, at right angles to 2 V, H K parallel to D E: then will

 the

the plane D H K E reprefent the tranfparent plane, on which the perfpective reprefentation is to be made. Next to find the perfpective points of the angles of the triangle, let fall perpendiculars A 1, C 2, B 3 from the angles to the fundamental DE : fet off thefe perpendiculars upon the fundamental oppofite to the point of diftance K, to B, A, C; from 1, 2, 3, draw lines to the principal point V; and from the points A, B, and C on the fundamental line, draw the right lines A K, B K, C K, to the point of diftance K; which is fo called, becaufe the fpectator ought to be fo far removed from the figure or painting, as it is diftant from the principal point V. The points *a*, *b*, and *c*, where the vifual lines V 1, V 2, V 3 interfect the lines of diftance A K, B K, C K, will be the angular points of the angle *a b c*, the true reprefentation of A B C.

By proceeding in this manner with the angular points of any right-lined figure, whether regular or irregular, it will be very eafy to reprefent it in perfpective : however, in practice, feveral compendious methods will occur to every artift.

Again, if the fcenographic appearance of any folid were to be reprefented; fuppofe of a triangular prifm, whofe bafe is the triangle *m n o* (*ibid.* fig. 8.); you need only find the upper furface of it, in the fame manner as you found the lower, or bafe; and then joining the correfponding points by right lines, you will have the true reprefentation of the folid in perfpective. So that the work is the fame as before; only you take a new fundamental line, as much higher than the former, as in the altitude of that folid whofe fcenographic reprefentation you would delineate.

But there is ftill a more commodious way, which is this : having found, as above, the bafe or ichnographic plane *m n o*, (*ibid.*) let perdendiculars be erected to the fundamental line from the three angular points, which will exprefs the altitude of thofe points. But becaufe thefe altitudes, though equal in the body or folid itfelf, will appear unequal in the fcenographic view, the fartheft off appearing lefs than thofe nearer the eye, their true proportional heights may be thus determined. Any where in the fundamental line, let A B be erected perpendicularly, and equal to the true altitude; or, if the figure has different altitudes, let them be transferred into the perpendicular A B; and from the points A and B, and from all the points of intermediate altitudes, if there be any fuch, draw right lines to the point of fight V: thofe lines, A V, B V, will conftitute a triangle with A B, within which all the points of altitude will be contained. Through the points *o*, *n*, *m*, draw parallels to the fundamental line; and from the points *a*, *a*, &c. erect perpendiculars to thofe parallels; and the points where they interfect the lines A V, B V, as in *a*, *a*, *b*, *b*, &c. will determine the apparent height of the folid in that fcenographic pofition to the eye in V.

In practice, thefe parallels and perpendiculars are eafily drawn, by means of a good drawing-board or table, fitted for the purpofe.

The practical part of perfpective, is only the application of thefe rules to the actual defcription of objects. But, as this part is purely mathematical, its affiftance towards drawing is only what can be performed by rule and compafs, and can therefore ftrictly ferve only for finding the images of points, of which they are compofed; and, as thefe are infinite, it is endlefs to find them all by the ftrict rules; whence it becomes neceffary, after a fufficient number of them are found, to complete the image by the help of drawing, to the better effecting of which thefe points ferve as a guide. Thus, when a circle is to be defcribed, the practical rules ferve to find a fufficient number of points in the circumference; which being neatly joined by hand, will perfect the image, fo that, in ftrictnefs, nothing in this image is found by mathematical rules, fave the few particular points; the reft owes its being to the hand of the drawer. Thus alfo, if any complicated figure be propofed, it may not be eafy to apply the practical rules to the defcription of every minute part, but by inclofing that figure in a regular one, properly fubdivided and reduced into perfpective, that will ferve as a help, whereby a perfon, fkilled in drawing, may with eafe defcribe the object propofed: upon the whole, where the boundaries of the propofed objects confift of ftraight lines, and plain furfaces, they may be defcribed directly by the rules of perfpective; but when they are curvilinear, either in their fides or furfaces, the practical rules can only ferve for the defcription of fuch right-lined cafes as may conveniently inclofe the objects, and which will enable the defigner to

to draw them within those known bounds, with a sufficient degree of exactness.

It is therefore in vain to seek, by the practical rules of perspective, to describe all the little hollows and prominencies of objects, the different light and shade of their parts, or their smaller windings and turnings; the infinite variety of the folds in drapery; of the boughs and leaves of trees, or the features and limbs of men and animals; much less to give them that roundness and softness, that force and spirit, that easiness and freedom of posture, that expression and grace which are requisite to a good picture: perspective must content itself with its peculiar province of exhibiting a kind of rough draught to serve as a ground-work, and to ascertain the general proportions and places of the objects, according to their supposed situations, leaving the rest to be finished, beautified, and ornamented by a hand skilful in drawing.

It is true, perspective is of most use where it is most wanted, and where a deviation from its rules would be the most observable; as in describing all regular figures, pieces of architecture, and other objects of that sort, where the particular tendency of the several lines is most remarkable; the rule and compass, in such cases, being much more exact than any description made by hand: but still the figure, described by the perspective rules, will need many helps from drawing; the capitals, and other ornaments of pillars, and their entablatures, the strength of light and shade, the apparent roundness and protuberance of the several parts, must owe their beauty and finishing to the designer's hand: but, with regard to such objects as have no constant and certain determinate shape or size, such as clouds, hills, trees, rivers, uneven grounds, and the like, there is a much larger latitude allowable, provided the general bulk, or usual natural shape of those objects, be in some measure observed, so as not to make them appear unnatural or monstrous. See the article DRAWING.

But, although the strict practical rules of perspective are in a great measure confined to the description of right-lined figures, yet the knowledge of the general laws of that science is of great and necessary use to inform the judgment, after what manner the images of any proposed lines should run, which way they should tend, and where terminate; and thereby enables it the better to determine what appearance any object ought to put on, according to their different situations and distances: it accustoms the eye to judge, with greater certainty, of the relations between real objects and their perspective descriptions, and the hand to draw the same accordingly, and directs the judgment readily to discover any considerable error therein, which might otherwise escape notice. Besides that, when the ground, or general plan, and the principal parts of a picture are first laid down according to the rules, every thing else will more naturally fall in with them, and every remarkable deviation from the just rules will be the more readily perceived, and the easier avoided or rectified; so that although it may be infinitely tedious, or absolutely impracticable, to describe every minute part of a picture, by the strict mechanical rules; yet the employing them, where they can be the most commodiously used, will give the picture in general such a look, as will guide the artist in drawing the other parts without any obvious inconsistency.

We shall, therefore, give such rules as are of most general use in the practice of perspective. 1. Let every line, which in the object, or geometrical figure, is straight, perpendicular or parallel to its base, be so also in its scenographic delineation. 2. Let the lines, which in the object return at right angles from the fore-right side, be drawn scenographically from the visual point. 3. Let all straight lines, which in the object return from the fore right side, run in a scenographic figure into the horizontal line. 4. Let the object you intend to delineate, standing on your right-hand, be placed also on the right-hand of the visual point; and that on the left-hand, on the left-hand of the same point; and that which is just before, in the middle of it. 5. Let those lines which are (in the object) equidistant to the returning line be drawn in the scenographic figure, from that point found in the horizon. 6. In setting off the altitude of columns, pedestals, and the like, measure the height from the base line upwards, in the front or fore-right side; and a visual ray down that point in the front shall limit the altitude of the column or pillar, all the way behind the fore-right side, or orthographic appearance, even to the visual point. This rule you must observe in all figures, as well where there is a front or fore-right

right side, as where there is none. 7. In delineating ovals, circles, arches, crosses, spirals, and cross-arches, or any other figure in the roof of any room, first draw ichnographically, and so with perpendiculars from the most eminent points thereof, carry it up unto the ceiling; from which several points, carry on the figure. 8. The center in any scenographic regular figure is found by drawing lines from opposite angles: for the point where the diagonals cross, is the center. 9. A ground-plane of squares is alike, both above and below the horizontal line; only the more it is distant above or beneath the horizon, the squares will be so much the larger or wider. 10. In drawing a perspective figure, where many lines come together, you may, for the directing of your eye, draw the diagonals in red; the visual lines in black; the perpendiculars in green, or other different colour, from that which you intend the figure shall be of. 11. Having considered the height, distance, and position of the figure, and drawn it accordingly, with side or angle against the base; raise perpendiculars from the several angles, or designed points, from the figure to the base, and transfer the length of each perpendicular, from the place where it touches the base, to the base on the side opposite to the point of distance; so will the diametrals drawn to the perpendiculars in the base, by intersection with the diagonals, drawn to the several transferred distances, give the angles of the figures, and so lines drawn from point to point will circumscribe the scenographic figure. 12. If in a landskip there be any standing-waters, as rivers, ponds, and the like, place the horizontal line level with the farthest sight or appearance of it. 13. If there be any house, or the like, in the picture, consider their position, that you may find from what point in the horizontal lines to draw the front and sides thereof. 14. In describing things at a great distance, observe the proportion, both in magnitude and distance, in draught, which appears from the object to the eye. 15. In colouring and shadowing of every thing, you must do the same in your picture, which you observe with your eye, especially in objects lying near; but, according as the distance grows greater and greater, so the colours must be fainter and fainter, till at last they lose themselves in a darkish sky-colour. 16. The catoptrics are best seen in a common looking-glass, or other polished matter; where, if the glass be exactly flat, the object is exactly like its original; but, if the glass be not flat, the resemblance alters from the original; and that more or less, according as the glass differs from an exact plane. 17. In drawing catoptric figures, the surface of the glass is to be considered, upon which you mean to have the reflection: for which you must make a particular ichnographical draught, or projection; which on the glass must appear to be a plane full of squares, on which projection transfer what shall be drawn on a plane, divided into the same number of like squares; where though the draught may appear very confused, yet the reflection of it on the glass will be very regular, proportional, and regularly composed. 18. The dioptric, or broken beam, may be seen in a tube through a crystal or glass, which hath its surface cut into many others, whereby the rays of the object are broken. For to the flat of the crystal, or water, the rays run straight; but then they break and make an angle, which also by the refracted beams is made and continued on the other side of the same flat. 19. When these faces on a crystal are returned towards a plane placed directly before it, they separate themselves at a good distance on the plane; because they are all directed to various far distant places of the same. See the articles REFLECTION and REFRACTION.

Aerial PERSPECTIVE, is the art of giving a due diminution or degradation to the strength of the light, shade and colours of objects, according to their different distances, the quantity of light which falls on them, and the medium through which they are seen.

As the eye does not judge of the distance of objects entirely by their apparent size, but also by their strength of colours, and distinction of parts; so it is not sufficient to give an object its due apparent bulk according to the rules of stereography, unless at the same time it be expressed with that proper faintness and degradation of colour which the distance requires.

Thus if the figure of a man at a distance, were painted of a proper magnitude for the place, but with too great a distinction of parts, or too strong colours, it would appear to stand forward, and seem proportionally less, so as to represent a dwarf

dwarf ſituated nearer the eye, and out of the plane on which the painter intended it ſhould ſtand.

By the original colour of an object is meant that colour which it exhibits to the eye when duly expoſed to it in a full open uniform light, at ſuch a moderate diſtance as to be clearly and diſtinctly ſeen. This colour receives an alteration from many cauſes, the principal of which are the following.

1. From the objects being removed to a greater diſtance from the eye, whereby the rays of light which it reflects, are leſs vivid, and the colour becomes more diluted, and tinged, in ſome meaſure, by the faint bluiſh caſt, or with the dimneſs or hazineſs of the body of air through which the rays paſs.

2. From the greater or leſs degree of light with which the object is enlightened; the ſame original colour having a different appearance in the ſhades, from what it has in the light, although at an equal diſtance from the eye, and ſo in proportion to the ſtrength of the light or ſhade.

3. From the colour of the light itſelf which falls upon it; whether it be from the reflection of coloured light from any adjacent object, or by its paſſage through a coloured medium; which will exhibit a colour compounded of the original colour of the object, and the other accidental colours which the light brings with it.

4. From the poſition of the ſurface of the object, or of its ſeveral parts with reſpect to the eye; ſuch parts of it appearing more lively and diſtinct than thoſe which are ſeen obliquely.

5. From the cloſeneſs or openneſs of the place where the object is ſituated; the light being much more variouſly directed and reflected within a room, than in the open air.

6. Some original colours naturally reflect light in a greater proportion than others, though equally expoſed to the ſame degrees of it; whereby their degradation at ſeveral diſtances will be different from that of other colours which reflect leſs light.

From theſe ſeveral cauſes it happens that the colours of objects are ſeldom ſeen pure and unmixed, but generally arrive at the eye broken and ſoftened by each other; and therefore, in painting, where the natural appearances of objects are to be deſcribed, all hard or ſharp colouring ſhould be carefully avoided.

A painter, therefore, who would ſucceed in aerial perſpective, ought carefully to ſtudy the effects which diſtance, or the different degrees of, or colours of light, have on each particular original colour, to know how its appearance or ſtrength is changed in the ſeveral circumſtances above mentioned, and repreſent it accordingly; ſo that in a picture of various coloured objects, he may be able to give each original colour its own proper diminution or degradation, according to its place.

Now, as all objects in a picture are proportioned to thoſe placed in the front; ſo in aerial perſpective, the ſtrength of light, and the brightneſs of the colours of objects cloſe to the picture, muſt ſerve as a ſtandard, with reſpect to which, all the ſame colours at different diſtances, muſt have a proportional degradation in like circumſtances.

In order, therefore, to give any colour its proper diminution in proportion to its diſtance, it ought to be known what the appearance of that colour would be, were it cloſe to the picture, regard being had to that degree of light which is choſen as the principal light of the picture. For if any colour ſhould be made too bright for another, or for the general colours imployed in the reſt of the picture, it will appear too glaring, ſeem to ſtart out of its place, and throw a flatneſs and damp upon the reſt of the work; or, as the painters expreſs it, the brightneſs of that colour will kill the reſt.

Perspective alſo denotes a kind of painting frequently ſeen in gardens, at the ends of galleries, *&c.* expreſsly deſigned to deceive the ſight.

Perspective glass, in optics, differs from a teleſcope in this: inſtead of the convex eye-glaſs placed behind the image, to make the rays of each pencil go parallel to the eye, there is placed a concave eye-glaſs as much before it; which opens the converging rays, and makes them emerge parallel to the eye.

The quantity of objects taken in at one view with this inſtrument, does not depend upon the breadth of the eye-glaſs, as in the aſtronomical teleſcope, but upon the breadth of the pupil of the eye.

Reflecting perſpective-glaſſes, called by ſome opera-glaſſes, or diagonal perſpectives, are ſo contrived, that a perſon can view any one in a public place, as the opera or play-houſes, without it being poſſible to diſtinguiſh who it is he looks at,

at. A section of it is delineated in plate CXCVIII. fig. 9. where *k a l* is the eye-glass, *i b b* the object-glass, and *d c e* a little speculum or reflecting plane, which is fixed obliquely in a short tube *f g h i*, screwed upon the end of the perspective tube *h i k l*, so that its axis shall make about half a right angle with the speculum. By this means, an object Q will be seen by the eye at *a*, in the returning ray Q *c b a*; so that the way to find an object, intended to be viewed by this instrument, is to direct its axis at a right angle to the rays that come from the object; and if the object be higher or lower, it may be found by turning the perspective to and fro about its axis.

If the object be too near to be seen at the perspective end *k a l*, turn the other to the eye; and by looking through the hole *x*, you will see the object S, by the ray S *t v x*; coming through the hole *t*, and reflected from another speculum parallel to the former. If the spectator be short-sighted, a concave-glass must be placed in the hole *x*, otherwise a plane one, to make the instrument more like a common perspective.

In both these cases, the speculum neither magnifies nor diminishes the appearance of the object; for if the axis *a c* be produced till $cq = c$Q, the reflected rays will diverge as from an image at *q* equal to the object at Q; with this difference only, that the right side of the object will appear on the left-hand, and the left side on the right.

PERSPECTIVE PLANE, is the glass, or other transparent surface, PV, (plate CXCVIII. fig. 1.) supposed to be placed between the eye and the object, perpendicular to the horizon. It is sometimes called the section, table, or glass.

PERSPICUITY, *perspicuitas*, in rhetoric, is a principal virtue of style, to which all the ornament and beauties of speech ought to give way. See STYLE.

Vossius observes, that a discourse is obscured by too much conciseness and profuseness; several rhetorical figures are likewise destructive of perspicuity.

PERSPIRATION, in medicine, the evacuation of the juices of the body through the pores of the skin. Perspiration is distinguished into sensible and insensible: and here sensible perspiration is the same with sweating, and insensible perspiration, that which escapes the notice of the senses; and this last is the idea affixed to the word perspiration when used alone. The vessels, through which perspiration is performed, lie obliquely under the scales of the scarf skin, and are so inconceivably small, that from a calculation made by Leewenhoeck, it appears that the mouths of an hundred and twenty-five thousand of them may be covered with a common grain of sand. The matter of insensible perspiration, is a fine subtile fluid which exhales from the body in the form of a vapour, and proceeds from the whole surface and from every cavity: it is of an aqueous and saline nature, and seems to have a great analogy with urine; because in a healthy state, the increase of the one diminishes the other. Many experiments prove its existence. If you pass your finger over the surface of a looking-glass, or any other polished body, it will leave a track of moisture. If you put your naked head near a white wall, exposed to the sun, the shadow of the vapours which proceed from the pores of the skin, may be plainly seen: or if you breathe upon glass, you may perceive it covered with small drops of water; and the vapours which proceed from the lungs, are in winter condensed by the cold, and form a kind of bluish mist, proceeding from the mouth. Other experiments shew that the matter evacuated this way, is at least in some countries more than equal to all the other evacuations by stool, urine, &c. Sanctorius found in Italy, under the circumstances of a moderate diet, middle age, and easy life, that the matter insensibly perspired was five-eights of that taken in for food; so that there only remained three-eighths for nutrition, and for the excrements of the nose, ears, intestines, bladder, &c. The same author shews, that as much is evacuated by perspiration in one day, as by stool in fourteen days.

But Dr. Bryan Robinson, of Dublin, has found the case very different, both in England and Ireland, and even in South Carolina, in all which places he found that the quantity of urine exceeds that of perspiration, and that if the meat and drink of one day be four pounds and a half, the perspiration of that day will be two pounds, the urine two pounds five ounces, and the stool three ounces.

The matter of sweat is separated from the blood by the miliary glands, and is therefore much more gross than that of insensible perspiration; for as there are no glands which serve for the excretion of

of this laſt fluid, it is ſuppoſed to proceed from the extremities of the capillary arteries.

The uſe of perſpiration is to preſerve the ſuppleneſs of the papillæ of the ſkin; to carry the ſaline particles off from the blood, and by this means to render it more pure; to preſerve the body from various diſeaſes, and to contribute to the cure of the moſt dangerous diſtempers. It may be promoted by exerciſe, by dry frictions with a coarſe linen-cloth, or a fleſh-bruſh, by warm baths, and waſhing the hands, feet, head, *&c.*

PERTH, the capital of the county of the ſame name in Scotland, thirty miles north of Edinburgh.

PERTHAMBOY, a port-town of New Jerſey, in North America: weſt long. 74°, north lat. 40° 45′.

PERTHOIS, a ſubdiviſion of the province of Champaign, in France, ſituated on the confines of Lorrain.

PERTICATA, in old law-books, is the fourth part of an acre; or a piece of ground containing one pearch in breadth, and four in length.

PERU, formerly a powerful empire in South America, but now a province of Spain, is ſituated between 60° and 81° of weſt longitude, and between the equator and 25° of ſouth latitude: being near 2000 miles in length from north to ſouth, and from 200 to 500 broad: it is bounded by Popayan, on the north; by the mountains of Andes, on the eaſt; by Chili and La Plata, on the ſouth; and by the Pacific Ocean, on the weſt.

Balſam of PERU. See BALSAM.

PERUGIA, a city of Italy, in the territories of the pope: eaſt long. 13° 16′, north lat. 43°.

PERUVIAN BARK. See QUINQUINA.

PES FORESTÆ, the foreſt foot, an engliſh long meaſure, containing eighteen inches.

PES MONETÆ, in antient records, ſignifies a true and reaſonable adjuſtment of the real value of the current coin.

PESADE, or PESATE, in the manege, is a horſe's raiſing his fore-quarters, and bending his feet up to his body without ſtirring his hind-feet.

This motion is the true means to fix his head and haunches, and to hinder him from ſtamping with his feet.

PESARO, a city of Italy, in the province of Urbino, ſituated on the gulph of Venice: eaſt long. 14°, north lat. 44°.

PESCARA, a port-town of Italy, in the kingdom of Naples: eaſt long. 15° 25′, north lat. 42° 30′.

PESCHIERA, a town of Italy, in the territory of Venice, and province of Verona: eaſt longitude 11°, north latitude 45° 35′.

PESSARY, in medicine, a ſolid ſubſtance compoſed of wool, lint, or linen, mixed with powder, oils, wax, *&c.* made round and long like a finger, in order to be introduced into the exterior neck of the matrix, for the cure of ſeveral diſorders incident to the uterus.

This name is alſo ſometimes given to pieces of cork, or other matters thruſt up the noſtrils, *&c.* to prevent the entrance of ſtrong infectious ſteams.

PEST, a city of Upper Hungary, ſituated on the Danube: eaſt long. 19° 15′, north lat. 47° 42′.

PEST-HOUSE, the ſame with lazaretto or lazar-houſe. See LAZAR-HOUSE.

PESTILENCE, in medicine, an epidemical, contagious and malignant diſeaſe, popularly known by the name of plague. See the article PLAGUE.

PESTILENTIAL FEVERS, ſuch as are attended with ſome malignant quality, and approach to the nature of the plague. See the articles BILIOUS-FEVERS, and HOSPITAL-FEVER.

PETAL, among botaniſts, an appellation given to the flower-leaves, in oppoſition to the folia, or common leaves of the plant.

According to the number of petals in each flower it is ſaid to be monopetalous, or to conſiſt of a ſingle petal; dipetalous, when it has two; tripetalous, when three, *&c.* See the article FLOWER.

PETALISM, πεταλισμος, in antiquity, a kind of baniſhment practiſed at Syracuſe, by writing the perſon's name on a leaf, πεταλον, whence the name.

It differed only from the oſtraciſm at Athens, as this laſt was voted by means of ſhells, οςρακα, and laſted ten years; whereas, the petaliſm was voted by means of leaves, and laſted only five years.

PETARD, in the art of war, a metalline engine, ſomewhat reſembling a high-crowned hat.

The petard may be conſidered as a piece of ordnance; it is made of copper mixed with braſs, or of lead with tin: its charge is from five to ſix pounds of powder, which reaches to within three fingers-breadth of the mouth; the vacancy is filled with tow, and ſtopped with a

wooden tampion, the mouth being ftrongly bound up with cloth tied very tight with ropes. It is covered up with a madrier, or wooden plank, that has a cavity to receive the mouth of the petard, and faftened down with ropes, as reprefented in plate CXCVII. fig. 5.

Its ufe is in a clandeftine attack to break down gates, bridges, barriers, &c. to which it is hung; and this it does by means of the wooden plank. It is alfo ufed in countermines to break through the enemy's galleries, and give their mines vent.

The invention of petards is afcribed to the french Huguenots, in 1579, who with them took Cahors, as D'Aubigné tells us.

PETARDEER, a perfon who loads, fixes, and fires petards. See the preceding article.

PETASITES, BUTTERBUR, in botany, is comprehended by Linnæus among the tuffilagos, or colts-feet. See the article TUSSILAGO.

The root of the common butterbur is celebrated for its cordial and alexipharmic virtues; and befides being aperient and detergent, is prefcribed in fuppreffions of urine and the menfes; as alfo in the cough, afthma, and other diforders of the breaft.

PETASUS, in antiquity, a covering for the head, with a broad brim, not unlike that of our hats, ufed on journies to fave the face from being fun-burnt.

PETECHIÆ, in medicine, denote fpots in the fkin like flea-bites, which come out in malignant fevers, hence called petechial, or fpotted fevers. See the article MALIGNANT.

The more florid the fpots are, the lefs is the danger; and it is a good fign if the black or violet coloured ones become of a brighter colour. The large, black, and livid fpots, are almoft always attended with profufe bleeding: the fmall dufky-brown fpots, like freckles, are almoft as bad as the black and livid ones.

The eruption of the fpots is uncertain; fometimes they appear on the fourth or fifth day, fometimes not till the eleventh, or later. The vibices, or large livid, or darkifh-green marks, feldom appear till very near the fatal period.

The treatment in all malignant fevers is much the fame with that of the hofpital-fever. See the article HOSPITAL-FEVER.

PETER, or *Epiftles of St.* PETER, two canonical books of the New Teftament, written by the apoftle St. Peter, and addreffed to thofe jewifh converts who were fcattered throughout Pontus, Galatia, &c. not only upon the perfecution raifed at Jerufalem, but upon former difperfions of the Jews into thofe places. The firft of thefe epiftles is principally defigned to comfort and confirm them, under thofe fiery trials they were then fubject to; and to direct them how to behave in the feveral ftates and relations, both of the civil and the chriftian life. In the fecond epiftle, the apoftle profecutes the fame fubject, to prevent their apoftacy from the faith, and guard them againft the corrupt principles of the gnoftics, and thofe who fcoffed at the promife of Chrift's coming.

St. PETER'S DAY, a feftival of the chriftian church, obferved on the twenty-ninth of June.

PETERBOROUGH, a city of Northamptonfhire, fituated on the river Nen, thirty-four miles north-eaft of Northampton: weft long. 15′, north lat. 52° 53′.

It fends two members to parliament.

PETER-PENCE, an antient tax of a penny on each houfe, paid to the pope.

It was called peter-pence becaufe collected on the day of St. Peter *ad vincula*, and fent to Rome; whence it was alfo called Rome-fcot and Rome-penny.

PETERSBURG, the capital city of Ruffia, and one of the largeft and moft populous cities in the world, fituated on both fides the river Nieva, in the provinces of Carelia and Ingria, between the gulph of Finland and the lake Ladoga: eaft long. 31°, north lat. 60°. There were no lefs than fixty-five thoufand houfes built within three or four years after the foundation was laid, which was in the year 1703.

PETERSFIELD, a borough-town of Hampfhire, fifteen miles fouth-eaft of Winchefter.

It fends two members to parliament.

PETERSHAGEN, a town of Germany, in the circle of Weftphalia and dutchy of Minden, thirty-feven miles weft of Hanover: fubject to Pruffia.

PETERWARADIN, a fortified town of Sclavonia, fituated on the Danube, thirty-five miles north weft of Belgrade.

PETHERTON, a market-town of Somerfetfhire, 16 miles fouth-weft of Wells.

PETIGLIANO, a town of Italy, in the dutchy of Tufcany: eaft long. 12° 45′. north lat. 42° 45′.

PETIOLE, *petiolum*, in botany, the flender ftalk that fupports the leaves of a plant. Some

Some alſo uſe the word petiole for the middle rib of a leaf; the branches thereof being called rami, and the ſubdiviſions of theſe ſurculi.

PETITGUAVES, a port-town of Hiſpaniola, ſituated on a bay at the weſt end of the iſland: weſt long. 76°, north lat. 18° 5′: ſubject to France.

PETITIO INDUCIARUM, in the civil-law, the ſame with imparlance in common law. See IMPARLANCE.

PETITIO PRINCIPII, in logic, the taking a thing for true, and drawing concluſions from it as ſuch; when it is really falſe, or at leaſt wants to be proved, before any inferences can be deduced from it.

PETITION, a formal ſupplication or requeſt made by an inferior to a ſuperior, eſpecially to one having ſome juriſdiction. By ſtatute no perſon ſhall procure above twenty hands to a petition to the king or parliament, for any alteration either in church or ſtate, unleſs by order of three or more juſtices of the peace, &c. nor ſhall deliver ſuch petition in the preſence of above ten perſons, on pain of forfeiting one hundred pounds. 13 Car. II. c. 5.

PETIVERIA, in botany, a genus of the hexandria-tetragynia claſs of plants, without any flower petals, only the cup being coloured red has much the appearance of ſuch: the ſeed is ſingle, flatted and emarginated, and armed with the four ſtyles.

PETRE, or SALT-PETRE, the ſame with nitre. See the article NITRE.

PETREA, in botany, a genus of the didynamia-angioſpermia claſs of plants, with a monopetalous flower, divided into five rounded ſegments at the limb. There is no deſcription of the fruit or ſeed of this plant.

PETRIDIA, in natural hiſtory, a genus of ſcrupi, of a plane, uniform ſtructure, of no great variety of colours, and emulating the external form of pebbles. See the article SCRUPI.

Dr. Hill deſcribes no leſs than twelve ſpecies of this genus. 1. The various-ſized, pellucid, colourleſs, cryſtalliform petridium, commonly called the pebble-cryſtal. 2. The purple, ſemipellucid, cryſtalline petridium. 3. The ſnow-white, opake, cryſtalline petridium. 4. The opake, whitiſh, reddiſh, or yellowiſh, cryſtalline petridium, commonly called red, white, and yellow, ſparry pebbles. 5. Yellowiſh, white, pumiceoſe, or ſpungy petridium. 6. Hard, porous, whitiſh, cryſtalline petridium. 7. Greyiſh, white, opake, ſtony petridium. 8. Friable, ſhining, white, arenaceous petridium. 9. White, cryſtalline petridium, ſpotted with ſmall yellow dots. 10. Whitiſh-brown, dull petridium. 11. Bluiſh, white, hard cryſtalline petridium. And, 12. Browniſh, white, hard, ſhining petridium.

PETRIFACTION, in phyſiology, denotes the converſion of wood, bones, and other ſubſtances into ſtone. See the article STONE.

The foſſile bodies found petrified are principally either of vegetable or animal origin, and are more or leſs altered from their original ſtate, according to the different ſubſtances they have lain buried among in the earth; ſome of them having ſuffered very little change, and others being ſo highly impregnated with cryſtalline, ſparry, pyritical, or other extraneous matter, as to appear mere maſſes of ſtone or lumps of the matter of the common pyrites; but they are generally of the external dimenſions, and retain more or leſs of the internal figure of the bodies into the pores of which this matter has made its way.

The animal ſubſtances thus found petrified are ſea-ſhells, the teeth, bony palates and bones of fiſh, the bones of land animals, &c. Theſe are found variouſly altered, by the inſinuation of ſtony and mineral matter into their pores; and the ſubſtance of ſome of them is now wholly gone, there being only ſtony, ſparry, or other mineral matter remaining in the ſhape and form. See the articles FOSSIL, *Foſſil* PLANTS, SHELLS, &c.

PETROBRUSSIANS, in church-hiſtory, a religious ſect which aroſe in France and the Netherlands, about the year 1126, ſo called from their leader Peter Bruys. They denied that children, before the uſe of reaſon, can be juſtified by baptiſm. They alſo condemned all places of public worſhip, croſſes, crucifixes; and are ſaid to have rejected the ſacrament of the euchariſt, and prayers for the dead.

PETROLEUM, alſo called rock-oil, or oil of petre, is an extremely ſubtle and penetrating fluid, and is by much the thinneſt of all the native bitumens. It is very light and very pellucid; but tho' equally bright and clear under all circumſtances, it is liable to a very great variety in its colour. It is naturally almoſt colourleſs, and in its appearance greatly reſembles the moſt pure oil of turpentine:

this is called white petroleum, though it has no more colour than water; it is fometimes tinged of a brownifh, reddifh, yellowifh, or faint-greenifh colour; but its moft frequent colour is a mixture of the reddifh and blackifh, in fuch a degree that it looks black when viewed behind the light, but purple when placed between the eye and a candle or window. It is of a pungent and acrid tafte, and of a very ftrong and penetrating fmell, which very much approaches to that of the diftilled oil of amber. The white is moft efteemed. It is fo very inflammable, that while it floats on the furface of the water, as it does in many parts of Italy, it takes fire at the approach of a candle.

Petroleum is found in rivers, in wells, and trickling down the fides of hills along with little ftreams of water. In fhort, it is the moft frequent of all the liquid bitumens, and is perhaps the moft valuable of them all in medicine. It is to be chofen the pureft, lighteft, and moft pellucid that can be had, fuch as is of the moft penetrating fmell and is moft inflammable.

It is principally ufed externally, in paralytic cafes, and in pains of the limbs. The French give it internally in hyfteric complaints, and to their children againft worms; fome alfo give it from ten to fifteen drops in wine, for fuppreffion of the menfes. Thefe, however, are rather the practice of the common people than of the faculty.

PETROMYZON, in ichthyology, a genus of the chondropterygious order of fifhes, the foramina, or aperture, of whofe gills are feven on each fide, fituated longitudinally; and there is, befide thefe, one in the middle of the head, between the eyes: the body is long and flender, and nearly cylindric, and is fmooth: there are only two fins, both fituated on the back of the fifh.

To this genus belong the lamprey, and lamprey-eel. See LAMPREY.

PETRONEL, a fort of harquebufs, or hand-gun. See HARQUEBUSS.

PETROSA OSSA, in anatomy, a name given to the fourth and fifth bones of the cranium, called alfo offa temporum, and offa fquamofa; the fubftance whereof, as their firft and laft names exprefs, is fquamofe and very hard. See the article SKULL.

Thofe bones are fituated in the lateral and lower part of the head; and are bounded at top by the fquamous future, which joins them to the parietalia, and behind by the lambdoides, which joins them to the occipital, and connects them to the os fpheroides. Each has two finufes, before and behind the fphenoides: the exterior, which is lined with a cartilage, and receives the procefs of the lower jaw; the interior receives the lower part of the finus lateralis of the dura mater: each again has four proceffes, three of which are external, and one internal: of the external, the firft is called the zygomatic, or jugal; the fecond, the maftoide, or mammillar; the third, the ftyloide; each of which fee under its proper article.

The internal procefs is properly called the os petrofum; this is pretty long and large, containing the whole meatus auditorius, and cavity of the tympanum. See the article EAR.

PETTAW, a city of Germany, in the circle of Auftria: eaft longitude 16° 8′, north latitude 47°.

PETTEIA, πεττεια, in the antient mufic, the art of making a juft difcernment of all the manners of ranging or combining founds among themfelves, fo as they may produce their effect, that is, exprefs the feveral paffions they are intended to raife: it fhews what founds are to be ufed, and what not; how often any of them are to be repeated, with which to begin, and with which to end: Petteia, therefore, is in mufic what manners are in poetry.

PETTIPOLI, a port-town on the coaft of Cormandel, in the hither India, where the Dutch have a factory: eaft long. 80°, north lat. 16° 45′.

PETTREL, in ornithology, a name for the procellaria, or ftorm-bird. See the article PROCELLARIA.

PETWORTH, a town of Suffex, ten miles north-eaft of Chichefter.

PETTY-BAG, an office in chancery, the three clerks of which record the return of all inquifitions out of every county, and make all patents of comptrollers, gaugers, cuftomers, &c.

PETTY-FOGGER, a little, tricking folicitor or attorney, without either fkill or confcience.

PETTY, or PETIT LARCENY. See the article LARCENY.

PETTY-PATEES, among confectioners, a fort of fmall pies, made of a rich cruft filled with fweat-meats.

PETTY-SINGLES, among falconers, are the toes of a hawk.

PETTY-TALLY, in the sea-language, a competent allowance of victuals, according to the number of the ship's company.

PETTY, or PETIT-TREASON. See the article TREASON.

PETUNSE, in natural-history, one of the two substances whereof the porcelain or china-ware is made. See PORCELAIN.

The petunse is a coarse kind of flint or pebble, the surface of which is not so smooth, when broken, as that of our common flint. See the article FLINT.

PEUCEDANUM, HOG'S FENNEL, in botany, a genus of the pentandria-digynia class of plants, the general corolla of which is uniform, and each single flower consists of five equal, oblong, crooked and undivided petals; there is no pericarpia; the fruit is oval and compressed.

The root of hog's fennel is recommended in the cough and other disorders of the breast, and in obstructions of the viscera.

PEWTER, a factitious metal, used in making domestic utensils, as plates, dishes, *&c.*

The basis of this metal is tin, which is converted into pewter, by mixing at the rate of an hundred weight of tin with fifteen pounds of lead and six pounds of brass. See the article METAL.

Besides this composition, which makes the common pewter, there are other kinds compounded of tin, regulus of antimony, bismuth and copper, in several proportions.

Pewter has occasionally served for money. According to Mr. Putland, king James II. turned all the pewter vessels of the protestants in Ireland he could seize, into money; half crowns were somewhat bigger than half-pence, and other pieces in proportion. This money he ordered to be current in all payments; whence, our author observes, people absconded for fear of being paid their debts: he also mentions crown-pieces of this metal, with the legend on the rim, *melioris tessera fati.*

PEYBUS, or PEPUS. See PEPUS.

PEZENAS, a town of Languedoc, in France, thirty miles south-west of Montpelier.

PEZIZA, in botany, a genus of mushrooms, of a campanulated figure, with orbiculated convexo-plane seeds. See the article MUSHROOM.

PFALTSBURG, a town of Lorrain, fifty miles east of Nancy.

PFRIT, or FORETTE, a town of Upper-Alsace, ten miles west of Basil.

PFORTSHEIM, a city of Swabia, 28 miles south-west of Hailbron.

PHACA, in botany, the same with the astragaloides. See ASTRAGALOIDES.

PHÆNOMENON, φαινομενον, in philosophy, denotes any remarkable appearance, whether in the heavens or on earth; and whether discovered by observation or experiments.

PHAGEDÆNA, φαγεδαινα, in surgery, denotes a corroding ulcer. See the article ULCER.

PHAGEDÆNIC MEDICINES, those used to eat off fungous or proud flesh: such are all the caustics. See CAUSTIC.

Lime-water has this virtue in so high a degree, that it has got the name of phagedænic-water. See the article LIME.

PHALÆNA, in the history of insects, a genus of insects, of the order of the lepidoptera, the antennæ whereof are attenuated to the point, not clavated: the species of this genus are very numerous; some of them have the antennæ of a prismatic form; some have them pectinated, or made in fashion of a comb, and of these last, some have no tongue, and others have a spiral one; some have the antennæ pectinated, and sit with the wings flat or plane; others sit with the wings plane and patent, and have simple antennæ and a spiral tongue; some have the antennæ simple, and the tongue spiral, but do not sit with the wings plane, and of these some have the forehead prominent, others not; others again have the antennæ simple, and have no tongue.

PHALANGIUM, in zoology, the name of several species of spiders. See the article SPIDER.

PHALANGIUM, or ANTHERICUM, SPIDER-WORT, in botany, a genus of the hexandria-monogynia class, the flower of which consists of six very patent, oblong petals; and its fruit is an oval capsule with three cells, containing a great many angulated seeds.

Dale says that this plant is good against gripes, and the bites of spiders.

PHALANX, in grecian antiquity, a square battalion, consisting of eight thousand men, with their shields joined, and pikes crossing each other; so that it was next to impossible to break it.

Some think that the macedonian phalanx had the advantage of the roman legion. See the article LEGION.

The

The term phalanx, in anatomy, fignifies three rows of fmall bones in the fingers. See the article FINGERS.

PHALARIS, in botany, a genus of the triandria-digynia clafs of plants, with a bivalve corolla, and only a fingle feed contained in the corolla.

PHALEUCIAN VERSE, in antient poetry, a kind of verfe which confifts of five feet, the firft of which is a fpondee, the fecond a dactyl, and the three laft trochees; fuch is the following one of Martial,

1 2 3 4 5
Summam|nec metu|as di|em, nec|optes.

PHALLUS, in botany, a genus of mufhrooms, with a fmall umbilicated and perforated head. See MUSHROOM.

PHANATIC, a term of reproach formerly given to the diffenters, from a falfe fuppofition that they pretended to vifions, &c.

PHANTASM, φαντασμα, a term fometimes ufed in a fynonymous fenfe with idea, or the notion retained in the mind of an external object. See IDEA.

PHANTASTIC STYLE, in mufic, denotes a free and eafy manner of compofition, proper for inftruments.

The peripatetics gave the colours of the rainbow the appellation of phantaftic, as fuppofing them to be only phantoms or deceptions of the fight; but Sir Ifaac Newton has demonftrated the contrary. See the article COLOUR.

PHANTASY, or FANCY, the fame with imagination. See IMAGINATION.

PHARISEES, a famous fect of the Jews, who diftinguifhed themfelves by their zeal for the traditions of the elders, which they derived from the fame fountain with the written word itfelf; pretending that both were delivered to Mofes from Mount Sinai, and were therefore both of equal authority. From their rigorous obfervance of thefe traditions, they looked upon themfelves as more holy than other men, and therefore feparated themfelves from thofe whom they thought finners or prophane, fo as not to eat or drink with them; and hence, from the hebrew word *pharis*, which fignifies to feparate, they had the name of pharifees, or feparatifts.

Their pretences to extraordinary piety, drew after them the common people, who held them in the higheft efteem and veneration. They held a refurrection from the dead, and the exiftence of angels and fpirits; but, according to Jofephus, this was no more than a pythagorean refurrection, that is, of the foul only, by its tranfmigration into another body, and being born anew with it. From this refurrection they excluded all who were notorioufly wicked, being of opinion, that the fouls of fuch perfons were tranfmitted into a ftate of everlafting woe: but as to leffer crimes, they imagined they were punifhed in the bodies which the fouls of thofe who committed them were next fent into.

According to this notion it was, that Chrift's difciples afked him, concerning the blind man, "Who did fin, this "man or his parents, that he was born "blind?" With the effenes, they held abfolute predeftination; and with the fadducees, free-will: but how they reconciled thefe feemingly incompatible doctrines, is no where fufficiently explained.

PHARMACY, the art or fcience which teaches the election, preparation, and mixture of medicines; conftituting one part of the therapeutic branch of medicine, the objects of which are all natural bodies. See MATERIA MEDICA.

As to the choice of fimple drugs, of which medicines are prepared, regard muft be had to the places of their growth, the climate, the feafon when they are moft in perfection, and the like.

The preparation of them confifts, 1. In wafhing and freeing them from grofs and ufelefs parts. 2. Herbs, flowers, fruits, and roots muft be dried. 3. Filings of fteel muft be moiftened with rain-water. 4. Some drugs muft be infufed in liquors, in order to diffolve them, as cerufe in vinegar; and others boiled to foften them, as the roots of althæa. 5. Some things, again, are to be fawed, or cut; others chopped, rafped, or filed; and, finally, others bruifed or broken, as roots and dried fruits.

The mixture of medicines confifts in blending and uniting them together, to make compofitions. To perform this properly, we muft learn to diftinguifh thofe ingredients which unite together naturally, from thofe which will not mix but by the affiftance of art. Oil, for inftance, mixes very well with fat fubftances; but will not unite, unlefs imperfectly, with water. The fpirit of falt feems to mix tolerably well with fpirit of wine; but their union will be rendered more intimate by digefting them together, for fome days, in a fandheat, and then diftilling them. We fhould

should likewise know the method of mixing several drugs, whether by pounding them in a mortar, dissolving, boiling, &c. The order of mixing drugs must likewise be observed: thus pulps ought to be mixed before powders, odoriferous ingredients should be mixed last, &c. Many other remarks might be made, relating to the composition of medicines; but they will come in more properly among the directions for making each particular sort, as they will be much better comprehended when the operations themselves are examined.

Some divide pharmacy into two parts, the galenic and chemical. See the articles GALENIC and CHEMISTRY.

PHARNACEUM, in botany, a genus of the pentandria-trigynia class of plants, without any corolla; but the calyx resembles one, being coloured on the inside, and its edges thin; the fruit is an oval capsule, obscurely trigonal, and in part covered by the cup; it consists of three cells, in which are contained numerous nitid, orbiculated, and depressed seeds, surrounded with a margin.

PHAROS, a small island in the Mediterranean sea opposite to Alexandria, in Egypt.

PHAROS, or PHARE, a LIGHT-HOUSE, a pile raised near a port, where fire is kept burning, in the night, to guide and direct vessels near at hand. The pharos of Alexandria, built in the island of Pharos, at the mouth of the Nile, was anciently very famous, insomuch as to communicate its name to all the rest. This most magnificent tower consisted of several stories and galleries, with a lantern at top, which being continually burning, might be seen for many leagues at sea, and along the coast.

PHARSALUS, a town of antient Thessaly, situated in european Turky, a little south of Larissa, in east long. 23°, and north lat. 39°.

PHARYNX, in anatomy, the upper part of the oesophagus. See OESOPHAGUS.

The muscles of the pharynx serve to open or shut the oesophagus: these are in number three pair, *viz.* the stylopharyngæus, the pterygopharyngæus, and the oesophagæus. See the article STYLOPHARYNGÆUS, &c.

There are a number of glands situated in the pharynx; and excretory oscula, or openings, are frequently discovered with them.

PHASACUM, in botany, a genus of the cryptogamia-musci class of plants, without any calyptra or apophysis.

PHASEOLUS, KIDNEY-BEAN, in botany, a genus of the diadelphia-decandria class of plants, the corolla whereof is papilionaceous; the vexillum is cordated, obtuse, emarginated and reclined with reflex sides; the alæ are roundish, of the same length with the vexillum, and stand upon long ungues; the carina is narrow, and revolves spirally in a contrary direction to the sun; the fruit is a long, straight, coriaceous, and obtuse pod; the seeds are oblong, compressed, and kidney-shaped.

PHASES, φάσεις, in astronomy, the several appearances or quantities of illumination of the moon, venus, mercury, and the other planets; or the several manners wherein they appear illuminated by the sun. See the articles MOON, MERCURY, VENUS, &c.

PHASIANUS, the PHEASANT, in ornithology. See PHEASANT.

PHASMATA, in physiology, certain appearances arising from the various tinctures of the clouds, by the rays of the heavenly luminaries, especially the sun and moon. These are infinitely diversified by the different figures and situation of the clouds, and the appulses of the rays of light.

PHASSACHATES, in natural history, the name of a species of agate, which the antients, in its different appearances, sometimes called also leucachates and perileucos. See the article AGATE.

The same agate, from the various proportion or manner of admixture of its particles in different specimens, often makes a very different figure; but no species is so liable to remarkable diversities of this kind as this. It is but of a small variety of colours, yet is often very beautiful: its ground or basis is always a pale, bluish grey, approaching to what we call a lead-colour or dove-colour. Sometimes it is equally and evenly of this colour, thro' the whole mass: but often also it is variegated within with veins of a deep black, and of a pure and clear white; these sometimes approach the surface of the stone, but more usually they are only near the center; and they are almost always disposed in concentrical, but irregular circles, round one, two, or more points. The pieces of this stone, cut where there are many of these veins, much resemble parts of onyxes.

It is found in the East Indies, and in Bohemia,

Bohemia, and fome other parts of Europe. When the whole matter of the veins and bafis of this ftone are blended together into one equal mafs, as is frequently the cafe both with this and many other of the naturally veined ftones, the whole becomes of a deeper greyifh blue, or a dove-colour, and is then the phaffachates; when the veins are kept diftinct and clear, it is the leucachates and perileucos, agreeing with all the defcriptions of the antients.

PHEASANT, *phafianus*, in ornithology, a genus of birds of the order of the gallinæ, with the fpace about the eyes naked, and no wattles.

The common pheafant would be very common in our woods, if it were not fo univerfally the delight of the fportfman and of the table. There are two other fpecies, *viz.* the fcarlet-breafted pheafant, nearly of the fize of the common kind; and the long-tailed, horned, and elegantly variegated pheafant of the Eaft Indies: this laft is covered all over with a profufion of the brighteft colours, yellow, red, white, bluifh-green, and almoft every tinge; it has alfo two callous fubftances, like horns, of a fine blue colour, above the eyes; and on each fide hangs a loofe fkin, of the fame colour, with fpots of an orange colour. See plate CXCVII. fig. 4.

Pheafants, on being imported from chriftmas to midfummer, pay a duty of 15 s. $4\frac{80}{100}$ d. the dozen, and draw back on exportation 13s. 6d. and pheafant-pouts, from midfummer to chriftmas, pay on importation 9 s. $7\frac{1}{2}$ d. the dozen, and draw back on exportation 8 s. $5\frac{1}{4}$ d.

PHEASANTS-ISLE, a little ifland in the river Bidaffoa, which divides France and Spain, fituated in weft longit. 1° 20′, and north lat. 43° 20′.

PHELLANDRIUM, WATER-HEMLOCK, in botany, a genus of the pentandria-digynia clafs of plants, the general corolla whereof is nearly uniform; the fingle flowers are unequal, they are compofed each of five acuminated cordato-inflex petals; the fruit is naked, fmooth, and coronated with the perianthium and piftils; it is feparable into two parts: the feeds are two, oval and fmooth.

PHELYPÆA, in botany, a genus of the didynamia-angiofpermia clafs of plants, the corolla whereof confifts of a fingle ringent petal; the tube is very fhort and roundifh; the faux is oblong, and the limb patent on both fides; the fruit is a roundifh, acuminated, compreffed capfule, containing one cell, and made up of two valves; the feeds are numerous and oblong.

PHENICIA, or PHOENICIA, a fubdivifion or province of Syria, fituated on the Levant, or eaftern part of the Mediterranean fea, on the confines of Paleftine.

PHEONS, in heraldry, the barbed heads of darts, arrows, or other weapons, and ufually reprefented as in plate CC, fig. 4.

PHIAL, a fmall thin glafs-bottle, vulgarly called a vial.

PHIDITIA, in grecian antiquity, feafts celebrated with great frugality at Lacedæmon. The phiditia were held in the public places, and in the open air: rich and poor affifted at them alike, and on the fame footing; their defign being to keep up peace, friendfhip, and a good underftanding and equality among all the citizens, great and fmall. It is faid, that they who attended this feaft, brought each a bufhel of flour, eight meafures of wine named chorus, five minæ of cheefe, and as much figs.

PHILADELPHIA, the capital of the province of Penfilvania, in North America, fituated on the rivers Delawar and Schoolkill: weft long. 74°, north lat. 40° 50′.

PHILADELPHIA is alfo the name of an antient town of the leffer Afia, fituated in eaft long. 29°, north lat. 38°.

PHILAUTIA, in the fchools, fignifies felf-love, or a vicious fondnefs and complaifance for a man's felf.

PHILADELPHUS, or SYRINGA, in botany, a genus of the icofandria-tetragynia clafs of plants, the flower of which confifts of four large, patent, roundifh, and emarginated petals; the fruit is an oval capfule, pointed at each end, and containing four cells, in which are lodged numerous oblong and fmall feeds.

PHILIP-FORT, a fortrefs in dutch Brabant, fituated on the eaft fide of the Scheld, oppofite to Pearl-fort five miles north-weft of Antwerp.

PHILIPS-NORTON, a market town of Somerfetfhire, fituated five miles fouth of Bath.

PHILIPPI, an antient town of Macedonia, a province of european Turkey, fituated in eaft long. 25°, north lat. 41°.

PHILIPPICS, φιλιππικοι λογοι, in literature, a name given to the orations of Demofthenes againft Philip king of Macedon; being efteemed the mafter pieces of that great orator.

Philippic is alſo a term applied to the fourteen orations of Cicero againſt Mark Anthony.

PHILIPPINE ISLANDS are ſituated in the Pacific ocean, in Aſia, between 114° and 131° eaſt longitude, and between 5° and 19° north latitude: there are a great number of them, and ſome very large. See LUCONIA, MENDANAO, *&c.*

PHILIPPINES, a religious ſociety of young women, at Rome; ſo called from their taking St. Philip de Neri for their protector: they conſiſt of an hundred poor girls, who are brought up till they are of age to be married, or become nuns, under the direction of ſome religious women, who teach them to read, write, and work; and inſtruct them in the duties of chriſtianity. They wear a white veil, and a black croſs on their breaſts.

PHILIPPOPOLI, a city of european Turky, in the province of Romania, ſituated on the river Mariza, in eaſt long. 25°, and north lat. 42° 20′.

PHILIPSBURGH, a city of Germany, in the palatinate of the Rhine, ſituated on the eaſt bank of the river Rhine, in eaſt long. 8° 16′, north lat. 49° 8′.

PHILIPSTAT, a town of Sweden, in the province of Gothland and territory Wermeland, ſituated in eaſt long. 14°, north lat. 59° 50′.

PHILIPVILLE, a town of the french Netherlands, in the province of Hainalt, twenty-two miles ſouth-weſt of Namur.

PHILIZER, or PHILAZER. See the article FILAZER.

PHILLYREA, or PHYLLYREA, in botany, a genus of the diandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle petal, divided into four ſhort ſegments at the limb; the fruit is a globoſe berry, with only one cell, in which is a ſingle large ſeed, of the ſame ſhape.

The leaves and bark of this ſhrub are ſaid to be aſtringent and good in ulcers of the mouth; but they are little regarded in the preſent practice.

PHILOLOGY, φιλολογία, a ſcience or rather aſſemblage of ſeveral ſciences, conſiſting of grammar, rhetoric, poetry, antiquities, hiſtory, and criticiſm.

Phylology is a kind of univerſal literature, converſant about all the ſciences, their riſe, progreſs, authors, *&c.* It makes what the French call the *belles lettres.* In the univerſities it is called humanities. Antiently, philology was only a part of grammar.

PHILOMATHES, a lover of learning or ſcience.

PHILONIUM, in pharmacy, a kind of ſomniferous anodyne opiate, taking its name from Philo the inventor.

There are two kinds of philonium, the perſian and the roman, the firſt of which is prepared thus: take of white-pepper and white-henbane, each ten drams; of opium, terra-ſigillata, each five drams; lapis hæmatitis, ſaffron, each two drams and an half; caſtor, indian-ſpikenard, pyrethrum, pearls, amber, zedoary, doronicum, or elſe elecampane, troches of ramich, each half a dram; camphor, a ſcruple; honey of roſes, fifteen ounces: mix them together for an opiate. The roots, the ſeeds, the caſtor, the ſaffron, and the troches of ramich, are to be reduced to a powder together; and the blood-ſtone, the pearls, and the amber, are to be levigated on a marble till they are reduced to an impalpable powder; and the ſealed earth, and the camphire, are to be pounded together. This preparation is proper for ſtopping hæmorrhages and fluxes, as alſo for preventing abortions: the doſe of it is from one ſcruple to one dram.

The philonium romanum is thus prepared: take of white-pepper and white-henbane-ſeeds, each five drams; opium, two drams and a half; caſſia-bark, one dram and a half; ſmallage-ſeed, one dram; and the ſeeds of macedonian-parſley, fennel, and candy-carrots, each two ſcruples five grains; ſaffron, one ſcruple and a half; ſpikenard, pellitory of Spain, and zedoary, each fifteen grains; cinnamon, a dram and a half; myrrh and caſtor, each a dram; ſyrup of white poppies, a ſufficient quantity to make the whole into an electuary. This is a powerful opiate, and given from ten grains to two ſcruples, to eaſe violent pains and procure ſleep.

PHILOSOPHER, φιλόσοφος, a perſon verſed in philoſophy; or one who makes profeſſion of, or applies himſelf to, the ſtudy of nature and morality. See the article PHILOSOPHY.

PHILOSOPHER'S STONE, the greateſt object of alchymy, is a long ſought for preparation, which, when found, is to convert all the true mercurial part of metal into pure gold, better than any that is dug out of the mines, or perfected by the refiner's art; and this only by caſting a little quantity thereof upon metals in fuſion, whilſt that part of the metal which

which was not mercury is immediately burnt or blown away. This ftone is faid to be equal in weight to gold, brittle like glafs, of a deep red colour, and melting like wax by the fire. Alchemifts have not only promifed this, but promifed alfo to make the like ftone for filver, which fhall convert all metals, except gold and filver, into the fineft filver. They have further, fays Boerhaave, promifed to perfect the philofopher's ftone to fuch a degree, that being projected upon any quantity of gold melted by the fire, it may convert the whole fubftance into philofopher's ftone; and, to exalt the fame ftill farther, that being projected upon pure quickfilver, it fhall convert the whole into philofopher's ftone. See the article TRANSMUTATION *of metals*.

All required is, fay the alchemifts, to do that by art which nature does in many years and ages; for as gold and lead do but differ little in weight, therefore there is not much in lead befides mercury and gold. Now if any body could be found which would fo agitate all the parts of lead, as to burn all that is not mercury therein, having alfo fulphur to fix the mercury, would not the mafs remaining be converted into gold? Such is the foundation for the opinion of the philofopher's ftone, which alchymifts contend to be a moft fixt, concentrated fire, which, as foon as it melts with any metal, does, by a magnetic virtue, immediately unite itfelf to the mercurial body of the metal, volatilizes and cleanfes off all that is impure therein, and leaves nothing but a mafs of pure gold.

There are two other ways whereby alchemifts have attempted to arrive at the making of gold: the firft is by feparation; for it is affirmed, that every metal yet known contains fome quantity of gold, only in moft the quantity is fo fmall that it will not defray the expence of getting it out.

The fecond is by maturation, for the alchemifts hold mercury to be the bafis and matter of all metals; that quickfilver, purged from all heterogeneous bodies, would be much heavier, denfer and fimpler than the native quickfilver; and that by fubtilizing, purifying, and digefting it, with much labour and long operations, it may be converted into pure gold. See the article GOLD.

PHILOSOPHER'S TREE. See the article DIANÆ ARBOR.

PHILOSOPHIC, or PHILOSOPHICAL, fomething that relates to philofophy. See PHILOSOPHY and PHILOSOPHER.

PHILOSOPHIC CHEMISTRY. See the article CHEMISTRY.

PHILOSOPHICAL EGG, among chemifts, a thin glafs-body, or bubble, of the fhape of an egg, with a long neck or ftem, ufed in digeftions.

PHILOSOPHY, φιλοσοφια, the knowledge or ftudy of nature and morality, founded on reafon and experience.

Philofophy, among the antients, was ufed in various fenfes: for, 1. It fometimes was taken for univerfal knowledge, *viz.* of all things human and divine. 2. In a ftricter notion, for the contemplation of nature only; and in this fenfe a philofopher was called by Plato φιλος της φυσεως, *i. e.* a friend and lover of nature. 3. Sometimes for ethics, or the doctrine of manners, which we call moral philofophy. 4. It included alfo the mathematical arts and difcipline, efpecially arithmetic and geometry. 5. The doctrine of exiftence, or *being* in the abftract, called metaphyfics. 6. For the knowledge τε πρωτε καλε, *i. e.* of the prime or chief good, *viz.* God; and this was their prima philofophia, or theology. 7. It was fometimes applied to logics or dialectics, which gave rules for reafoning about the nature of things. See the articles KNOWLEDGE, PHYSIOLOGY, and THEOLOGY.

Philofophy may be divided into three parts, intellectual, moral, and phyfical. The intellectual part comprizes logics and metaphyfics; the moral part contains the laws of nature and nations; and, laftly, the phyfical part comprehends the doctrine of bodies animate or inanimate. Thefe with their various fubdivifions, will take in the whole of philofophy. See the articles LOGIC, METAPHYSICS, ETHICS, POLITICS, &c.

Wolfius makes the three parts of philofophy to be the doctrine of God, the human foul, and of bodies: however, when he fubdivides, and comes to treat of the feveral branches feparately, his divifions readily come under the three heads, intellectual, moral, and phyfical, beforementioned.

For the method of philofophizing, or the rules for that purpofe, as eftablifhed by Sir Ifaac Newton, fee the article EXPERIMENTAL PHILOSOPHY.

From the firft broachers of new opinions, and the firft founders of fchools, philofophy is become divided into innumerable fects,

sects, some antient, others modern; such are the platonists, peripatetics, epicureans, stoics, pyrrhonians, and academics; and such are the cartesians, newtonians, &c. See the rise and doctrines of each sect under its proper head, PLATONIC, PERIPATETIC, EPICUREAN, STOICS, PYRRHONIANS, ACADEMICS, CARTESIANS, NEWTONIAN, &c.

The causes of errors in antient philosophy, or the reason why all former philosophers have, through so many ages, erred, may, as delivered by lord Bacon and Mr. Locke, be seen under the article ERROR.

PHILTER, or FILTER, in pharmacy. See the article FILTER.

PHILTER, or PHILTRE, φίλτρον, is more particularly used for a love-potion, or medicine to excite love.

PHILTRATION, or FILTRATION. See the article CLARIFICATION.

PHILYCA, in botany, a genus of the pentandria-monogynia class of plants, the corolla whereof consists of a single, imperforated, erect petal, rude upon the outside; the tube is of a conic form, and of the length of the perianthium; and the limb is quinquefid, erect, and small; the fruit consists of a roundish, trilobous, trilocular, and trivalvar capsule; and the seed is single, roundish, gibbous on one side, and angulated on the other.

PHIMOSIS, in medicine, a disorder of the penis, in which the prepuce is rendered so strict or tense, that it cannot be drawn back over the glans.

The general cause of a phimosis is, by physicians, rightly ascribed to impure coition; for while the virulent matter, which had been lodged in the sinuses of the vagina, continues between the skin and glans, the prepuce, especially if it be long or tight, can hardly escape being swelled with an inflammation, and a phimosis must be induced. Some, however, have the foreskin naturally so long, and so straight, that the glans can either be not at all or very little uncovered; but as this neither occasions trouble in discharging the urine, nor any impediment in procreation, it requires no aid from the surgeon, unless it be attended with inflammation, violent pain, or any remarkable inconvenience in coition. See the article GONORRHOEA.

If this disorder is occasioned by no venereal taint, it may be sufficient to bathe the penis, for some time, in warm water: but if it proceed from a venereal infection, proper internal medicines must be administered, and the other symptoms mitigated by washing out the virulent matter with a decoction of barley, mixed with honey of roses, which must be frequently injected with a syringe between the skin and the glans. To discuss the tumour, apply externally an emollient and digestive fomentation round the tumified part of the penis; and if the inflammation be severe, bleeding should not be omitted. But if, after this, the prepuce cannot be drawn back, let the end of it be pulled as far forwards as possible, while an assistant holds the covered glans with his fingers; then let the surgeon, with his left thumb, press back the glans, covered with the skin, and with a knife, or scissars, extirpate all that part of the prepuce which projects beyond his thumb, much in the same manner with the jewish circumcision; after which, the skin may be easily drawn back, and the glans being uncovered, may be more expeditiously cleansed and healed. Another method is, to divide with a pair of probe scissars so much of the prepuce as will suffice to denudate the glans; and after this longitudinal incision, some surgeons cut off, with the scissars, so much of the end of the prepuce as appears superfluous. These operations are usually attended with a pretty plentiful hæmorrhage, which should not be stopped by art, but rather permitted, according to the patient's strength, in order to abate the inflammation: dress the wound with dry lint, and apply a proper compress and bandage; and proceed afterwards as in the cure of other wounds, taking care not to heal it too hastily, nor too closely, lest there should be occasion to repeat the operation.

PHLEBOTOMY, in surgery, the opening a vein with a proper sharp-edged and pointed instrument of steel, in order to let out a proper quantity of blood, either for the preservation or recovery of a person's health. See DISEASE.

Phlebotomy, or bleeding, appears to be not only one of the most useful, but one of the most antient operations in surgery, and is frequently performed in different parts of the body, as the foot, the forehead, temples, neck, tongue, penis, and other parts, yet is most generally performed in that vein of the inside of the arm, which lies near the joint of the cubit, and therefore we shall begin with shewing the method of opening this vein. See VEIN.

The surgeon having tied on a fillet, about a hand's breadth above the bend of the

cubit; and the veins being compreſſed and enlarged, by the blood's being ſtopped in its return, he is to examine which vein lies faireſt, and is therefore moſt proper to be opened. In the arm are three principal veins; the firſt or uppermoſt of which is called the cephalic vein, the undermoſt the baſilic vein, and that in the middle the median. And here it is to be obſerved, that the median and baſilic veins, as they are larger than the cephalic, diſcharge a greater quantity of blood, but are attended with more danger in the operation; for a conſiderable artery and the brachial nerve lie under the baſilic vein, and the tendon of the biceps-muſcle under the median; but as they lie fairer to the eye, it is ſafer for the unexperienced ſurgeon to open the cephalic, or at leaſt the median vein; but ſometimes the veins are ſo ſituated as to deprive him of all choice. When the veins are not riſen, it will be proper to rub the arm below the bandage, to drive up the blood, and render the veins more turgid; while this is doing, the ſurgeon ſhould lay his thumb on the vein he intends to open, to prevent the blood from flowing back, and to keep the vein from rolling; and then holding the lancet, ſo that the thumb and firſt finger may be fixed about the middle of the blade, the other fingers ſhould reſt gently upon the patient's arm, to prevent his hand from ſlipping. The lancet is now to be puſhed ſlightly and carefully forward by the thumb and the fore-finger, till it has penetrated thro' the coats of the vein, and at that inſtant to be raiſed a little upwards in order to enlarge the orifice of the wound, and give a freer paſſage to the blood. When there ſeems to be a ſufficient quantity of blood diſcharged, the ligature muſt be immediately taken off, from above the elbow, and the ſkin about the orifice muſt be gently preſſed together by which means the lips of the divided vein are eaſily cloſed, and the little blood that may remain between the orifice and the vein diſcharged: one or two compreſſes are then put on, which the ſurgeon preſſes gently on the orifice with his left thumb, till the bandage is laid acroſs it, which is afterwards faſtened by turning it round the arm, both above and below the elbow, and tying both together.

In bleeding in the foot, it muſt be obſerved, that the veins proper for this operation, are the ſaphena and cephalica, the laſt of which extends itſelf from the internal ancle to the great toe; and the firſt, from the external malleolus to the ſmaller toes: bleeding in each of which is attended with the ſame effect: but if the veins upon the metatarſus, or inſtep, do not fully appear, it may be convenient to open one of thoſe at the ancle, or about the calf or ham of the leg, where the phlebotomiſt is not ſo liable to injure any of the tendons, as in the metatarſus. For the more eaſy apertion of theſe veins, the patient muſt firſt waſh both feet in warm water; and the ſurgeon having fixed upon the particular foot and vein, which appears moſt turgid, he applies a ligature about two fingers-breadth, above the ancle, or where he intends to open the vein, and puts it in the warm water again, while he takes out his lancet. Then kneeling down on one knee, he takes out the foot, and, it being wiped dry, places it on the other knee, or upon a board laid over the veſſel of warm water, and, ſecuring the vein from ſlipping with the thumb of his left hand, makes the orifice; but if the patient does not bleed freely, puts the foot again in the warm water, till he judges, by its colour, and the ſtrength of the patient, that a ſufficient quantity of blood has been drawn; the orifice is then to be cloſed by the thumbs, and, after drying the foot with a napkin, to be ſecured by compreſſes and a bandage.

In bleeding in the jugular veins of the neck, a ſtricture muſt be made round the lower part of the neck, with a neck-cloth or handkerchief, or the common ligature, to make the vein turgid or conſpicuous, and then either of the jugular veins being ſecured by the thumb, the inciſion muſt be made, and, the requiſite quantity of blood being taken away, the ligature muſt be removed, and the orifice compreſſed with the thumb, if the blood does not ſtop without, while the neck is wiped clean, after which the compreſs and circular bandage muſt be applied. It is to be obſerved, that if the diſorder lies in the whole head, or in the neck and fauces, the orifice may be made either in the right or left ſide indifferently; but when only one ſide of the head, or one eye is affected, the vein ought to be opened on that ſide in which the diſorder lies.

In bleeding in the veins of the forehead, temples, and occiput, a ſtricture muſt be made round the neck, and the ſame method uſed as in opening the jugular veins; only obſerving that the patient muſt

must hold down his head, to prevent the blood trickling into his eyes, *&c.*

In bleeding in the veins called ranulæ under the tongue, a stricture must be made round the neck, as before; you then elevate the apex of the tongue with your left hand, while with the lancet in your right hand, you circumspectly open first one, and then the other on each side; because the apertion of one only will hardly ever discharge blood enough to give any considerable relief. When you judge that a sufficient quantity of blood has run out of the mouth into the vessel, remove the ligature from the neck, upon which the flux usually stops of itself; but if it should still continue, let the patient take a little vinegar or frontiniac wine in his mouth, and hold it there till the hæmorrhage ceases, which cannot be dangerous, even without such topics.

In bleeding in the vena dorsalis penis, which runs along the upper side of the penis, and is generally pretty much distended, and conspicuous in an inflammation of this part, it is to be observed that it must be opened about the middle, and kept bleeding till the member becomes flaccid, and a sufficient quantity of blood is discharged; which done, you must apply a compress, and the bandage proper for the penis. But you must carefully endeavour to avoid injuring the arteries or nerves, which enter the penis near this vein; as also not to make your bandage too strict; for by this means, the inflammation and symptoms may turn out worse than before.

In bleeding in the eyes, there are several ways of performing the operation, but the best, in Heister's opinion, is the following. The patient being seated on a chair, and his head held in a proper posture, a transverse incision is to be made, with a fine lancet, upon the turgid small veins in the corners of the eye, so as to open them or cut them quite asunder. The eye-lids must be held apart with one hand, whilst the veins are opened with the other; and some use a pair of fine scissars for this purpose, instead of a lancet, and others elevate the veins with a crooked needle before they divide them; but in this operation the better way would be to make the needles with edges, that when the veins were thus elevated, they might divide them without the help of any other instrument. When the incision is made, the discharge of blood must be promoted by means of fomentation, with a spunge dipped in warm water; and if the discharge is not sufficient, the incision may be repeated two or three times: but few patients can be brought to suffer this, and there is no practising it at all upon infants, because they will not keep the eye steady.

For the use of leeches in bleeding, see the article LEECH.

PHLEGM, φλέγμα, in the animal oeconomy, one of the four humours whereof the antients supposed the blood to be composed. See the article BLOOD.

The chemists make phlegm, or water, an elementary body, the characters of which are fluidity, insipidity, and volatility: and yet quicksilver has all these, which nobody pretends to be phlegm. See the article WATER.

The phlegm of vitriol, Mr. Boyle observes, is an effectual remedy against burns, and excellent for discussing hard tumours: that of vinegar will extract a saccharine sweetness from lead, and even dissolve corals by long digestion: that of sugar of lead is said to dissolve pearls. Phlegm, or an insipid water, always comes out first in distillations; however, it is doubted, whether even repeated distillations can obtain it perfectly free from all other mixtures, or altogether devoid of smell and taste.

PHLEGMAGOGUES, in pharmacy, such medicines as purge off phlegm: such are hermodactyls, agaric, turbith, jalap, *&c.* See the article HYDRAGOGUES.

PHLEGMATIC, among physicians, an appellation given to that temperament, or habit of the body, wherein phlegm is predominant; which gives rise to catarrhs, coughs, *&c.* See the articles CATARRH and COUGH.

PHLEGMON, in surgery, denotes an external inflammation and tumour, attended with a burning heat, *&c.* See the article INFLAMMATION.

PHLEUM, in botany, a genus of the triandria-digynia class of plants, the corolla of which consists of two valves; and the seed, which is single, is included within the calyx and corolla.

PHLOGIDIAUGIA, a class of fossils, the characters of which are, that the bodies comprehended in it are transparent and inflammable: such are sulphur, orpiment, zarnich, and amber. See the articles SULPHUR, ORPIMENT, *&c.*

PHLOGISCIERIA, another class of fossils, which are inflammable bodies of a coarser and more impure texture, and not

not pellucid: ſuch are ambergreaſe, jet, aſphalta, ampelites, and lithanthrax. See AMBERGREASE, JET, &c.

PHLOGONIÆ, a claſs of compound, inflammable, and metallic foſſils, found in ſmall maſſes of determinately angular figures; comprehending the pyricubia, pyroctogonia, and pyripolygonia.

PHLOGOSIS, a ſmall inflammation of the eye. See the article OPHTHALMIA.

PHLOMIS, SAGE-MULLEIN, in botany, a genus of the didynamia-gymnoſpermia claſs of plants, the flower of which is monopetalous and ringent, and its four triquetrous ſeeds are contained in the bottom of the cup. Its leaves are accounted aſtringent and vulnerary.

PHLOX, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle hypocrateriform petal; the tube is cylindric and three times the length of the cup, narrow below, and crooked; the limb is plain, and divided into five roundiſh, equal, obtuſe ſegments, ſhorter than the tube: the fruit is an oval, but ſomewhat trigonal capſule, formed of three valves, and containing three cells: the ſeeds are ſingle and oval.

PHLYACOGRAPHIA, among the antients, a merry and burleſque imitation of ſome grave and ſerious piece, particularly a tragedy traveſtied into a comedy; being the ſame with the hilarody or hilarotragedy.

PHLYCTÆNÆ, in medicine, ſmall eruptions on the ſkin, ariſing from an hot or acrimonious humour. Hippocrates ſometimes repreſents them as reſembling thoſe puſtles which appear after ambuſtions.

PHLYSTÆNA, in medicine, a diſeaſe which produces buboes or tumours full of a ſerous humour.

PHLYZATION, in medicine, a puſtle or inflammation of the ſkin, or the bliſter ariſing from being burnt or ſcalded with hot liquor.

PHOCA, the SEA-CALF, in zoology, a genus of quadrupeds of the order of the feræ: the fore-teeth in the upper jaw are ſix, thoſe in the under jaw are only four: the feet have each five toes, and are palmated, and made for ſwimming: there are no ears.

This is a very ſingular and extraordinary animal, as ſeeming in ſome degree to connect the quadruped and the fiſh-kind: the common phoca grows to five feet or more in length: the whole body is covered with a fur, of a mixed greyiſh and yellowiſh colour; the creature is contrived for living a great part of its time under water: the foramen ovale of the heart being to this purpoſe continued open in it, as it is in a fœtus, which is to live without the aſſiſtance of breathing.

PHOCEA, a city of Oeolis, on the weſt coaſt of the leſſer Aſia, antiently ſo called. Phocea, or Phocis, was alſo a ſubdiviſion of Achaia, in the ancient Greece, now a part of Livadia in european Turky.

PHOENICOPTERUS, or FLAMINGO, in ornithology, a genus of birds, of the order of the anſeres, of which there is only one known ſpecies; its beak is bent in ſuch a manner as to appear broken, and is dentated at the edges. It is one of the moſt ſingular birds in the world, with an extremely long neck, and ſtill longer legs, in proportion to the ſize of its body: the covering feathers of its wings are all of the higheſt ſcarlet, and make a moſt glowing appearance; whence the name. See plate CXCIX. fig. 2.

PHOENIGMUS, in pharmacy, a medicine which produces redneſs with bliſters on the part to which it is applied. Such are muſtard-ſeed, pepper, veſicatories, &c. Theſe medicines are uſed to draw the humours to the part they are applied to, and to divert it from the part affected.

PHOENIX, in aſtronomy, one of the conſtellations of the ſouthern hemiſphere, unknown to the antients, and inviſible in our northern parts. This conſtellation is ſaid to conſiſt of thirteen ſtars. It took its name from that of a bird famous among the antients, but generally looked upon by the moderns as fabulous. The antients ſpeak of this bird as ſingle, or the only one of its kind: they deſcribe it as of the ſize of an eagle; its head finely creſted with a beautiful plumage, its neck covered with feathers of a gold colour, and the reſt of its body purple, only the tail white, and the eyes ſparkling like ſtars; they hold that it lives five or ſix hundred years in the wilderneſs; that when thus advanced in age, it builds itſelf a pile of ſweet wood and aromatic gums, and fires it with the wafting of its wings, and thus burns itſelf; and that from its aſhes ariſes a worm, which in time grows up to be a phoenix.

PHOENIX, the GREAT PALM, or DATE-TREE, in botany, a genus of plants, the characters of which are not yet perfectly aſcertained: the male and female flowers are

Fig. 1. PICA



Fig. 2. PHŒNICOPTERUS or *FLAMINGO*.



Fig. 3. PLATANUS, the *PLANE-TREE*.

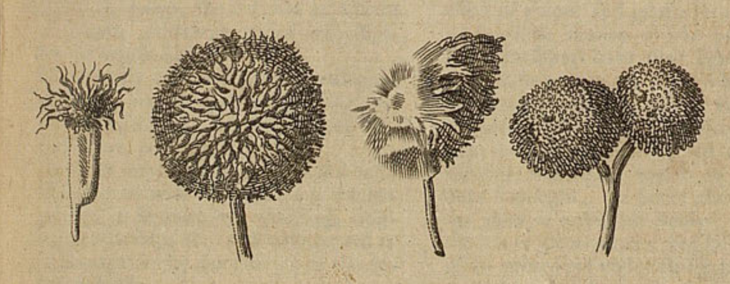
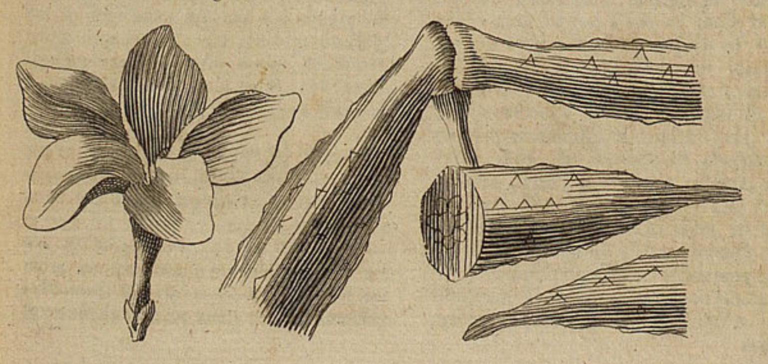


Fig. 5. PLUMERIA.



T Jefferys sculp

are on diftinct plants, or on the fame fpadix. In the male flowers the general fpatha is compofite; the fpadix is ramofe; the corolla is deeply divided into three hollow oval fegments; the ftamina are three flender filaments. In the female flowers the calyx is the fame as in the male; the corolla is divided into three principal fegments, with as many very fmall laciniæ: the fruit is an oval berry, having only one cell, and in that a fingle offeous feed, of a fub-oval figure, with a longitudinal furrow.

PHOLAS, a fhell-fifh of the multivalve-kind, compofed of five pieces, three of which are very fmall, fo that they feem to a fuperficial obferver to be made up of only two fhells.

The animal inhabiting the pholas is called tethys. They inhabit holes made in ftones and other folid bodies, as corals, the bottoms of fhips, &c. whence all fhell-fifh living in this manner have been commonly called pholades, fince there are mufcles and chamæ found lodged in the fame manner.

PHOLIS, in natural hiftory, a name given to the gypfums of a bright appearance.

PHONICS, φωνιχη, the doctrine or fcience of founds, otherwife called acouftics. See the article SOUND.

Phonics may be confidered as analogous to optics, and divided like that into direct, refracted, and reflected, as phonics, diaphonics, and cataphonics.

As to the object of phonics, found may be improved both with regard to the begetting, as in fpeaking, whiftling, finging, hollowing, &c. and with regard to its propagation by the pofition of the fonorous body.

With regard to the medium, phonics may be improved by the thinnefs and quiefcency thereof, and by the fonorous body being placed near a fmooth wall, either plane or arched, efpecially cycloidal or elliptical; whence the theory of whifpering-places: as alfo by placing the fonorous body near water, its found is mollified; and, on a plain, the found is conveyed to a greater diftance than on uneven ground, &c.

As to the ear, it is helped by placing it near a wall, efpecially at one end of an arch, the found beginning at the other, or near the furface of water or the earth; and by inftruments, as the ftentorophonicon or fpeaking-trumpet; alfo by an inftrument to help weak ears, by an inftrument to take in vaftly remote founds, by a microphone, and by a pholyphone. Cataphonics may be improved by feveral kinds of artificial echos. See the article HEARING.

PHORBÆA, or PHORBEIA, in the mufic of the antients, a name given to a fort of frenum or bandage applied to the mouths of people who played on the pipe; being a fort of leather band which went acrofs the forehead, then behind each ear, and then, making one or two turns round the head, it paffed over the mouth, where its office was to reftrain the lips from emitting too much breath at once, and caufe them to difcharge only juft as much as would ferve to inflate the pipe.

PHOSPHORUS, in phyfiology, a denomination given to all bodies which fhine and feem to burn, without having any degree of heat.

That thefe bodies owe their lucidity to the motion of the parts, feems evident for the following reafons: 1. Several phofphori are undoubtedly owing to putrefaction, as rotten wood, very ftale meat, efpecially veal, fome forts of fifh long kept, as oyfters, lobfters, flounders, whitings, &c. which putrefaction is the effect of a flow and gentle fermentation, or inteftine motion of the parts. 2. Moft phofphori have their light fo weak as to fhine only in the dark, which feems to argue a leffer degree of velocity in the parts, than what is neceffary to produce heat; becaufe this laft degree of velocity will caufe bodies to fhine in open day-light. 3. Some phofphori are the parts of animated bodies, as the cicindela or glow-worm; but all the parts of an animal are undoubtedly in motion. 4. Other phofphori put on the appearance of flame, as the ignis fatuus, the writing of common phofphorus made from urine, flafhes of lightening, &c. but all flame is nothing but a kindled vapour, whofe parts are all in motion, which may be too weak to caufe burning, or even a fenfible degree of heat. 5. Several of thofe innocent lambent flames may have their matter fo agitated, or the velocity of their motion fo increafed, as actually to produce heat, and burn: thus, the writing of phofphorus on blue paper, fufficiently rubbed, will kindle into an ardent flame, and burn the paper. 6. Phofphori feem to have the effential nature of fire, becaufe they are fo eafily fufceptible of a burning quality from fire: thus, common phofphorus is immediately kindled into a moft ardent

ardent and inextinguiſhable flame, by common fire. 7. By ſtroking the back of a black horſe, or cat, in the dark, we produce innumerable ſcintillæ, or lucid ſparks; in the ſame manner, the rubbing a piece of black cloth, which has hung in the ſun to dry, will cauſe it to throw out the particles of light which it had imbibed from the ſun; whereas, a white piece of cloth, which reflects moſt of the ſun's rays, emits no ſuch lucid ſparks in the dark.

Many other reaſons might be urged to ſhew, that light of every kind is owing to one and the ſame cauſe in a greater or leſſer degree, *viz.* the velocity of the parts of the lucid body.

Phoſphori in general, ſays Lemeri, may be conſidered as ſo many ſpunges full of the matter of light, which is ſo ſlightly retained therein, that a ſmall external force is ſufficient to put it in motion, and cauſe it to exhale in a lucid form: thus the phoſphori made of human urine, and other chemical preparations, receive ſo large a proportion of fire in their preparation, and retain it ſo well in their unctuous ſubſtance, that it may be kept there, in water, for twenty years; ſo as upon the firſt laying them open to the air, they ſhall take fire, and exhale in lucid flames. Not that the fire is ſuppoſed to be fixed and quieſcent all the while in the body of the phoſphorus; for that it has a real motion all the time is evident hence, that it is ſeen in any dark place, in the ſummer-ſeaſon, fulminating and emitting flaſhes (though, with all this, it ſcarce loſes any thing of the fire) ſo that the fire is not fixed in the phoſphorus, but in a continual undulatory motion.

Chemiſtry, ſays Dr. Shaw, hath ſcarce afforded any thing more ſurpriſing than the common phoſphorus. To ſee letters traced with this matter become luminous in the dark, images and the bodies of men to blaze with light, and abundance of the like experiments, performed by means of phoſphorus, muſt awaken the curioſity of thoſe who have ſeen theſe experiments, and render them deſirous of being acquainted with the method of preparing it. The preparation, even to this day, is kept as a ſecret in few hands, and the matter ſold at a very great price. Whence we apprehend it would be no unacceptable preſent to the world, to render this commodity cheaper, and diſcover its farther uſes.

The ſucceſsful method of preparing the phoſphorus of urine is this: evaporate any quantity of freſh urine over a gentle fire, to a black and almoſt dry ſubſtance; then, with two pounds thereof, thoroughly mix twice its weight of fine ſand; put this mixture into a ſtrong-coated ſtone long-neck; and having poured a quart or two of clear water into a large receiver, join it to the long-neck, and work it in a naked fire: let the heat be ſmall for the firſt two hours; then increaſe it gradually to the utmoſt violence: and continue this for three or four hours ſucceſſively: at the expiration of which time, there will paſs into the receiver a little phlegm and volatile ſalt, much black and fœtid oil, and, laſtly, the matter of phoſphorus, in form of white clouds, which either ſtick to the ſides of the receiver, like a fine yellow ſkin, or fall to the bottom in form of ſmall ſand. Now let the fire go out, but let the receiver continue till all be cold, leſt the phoſphorus take fire on the admiſſion of the air. To reduce theſe ſmall grains into one piece, put them into a little tin ingot-mould, with water; heat the ingot to make the grains melt together; then add cold water, till the matter is congealed into one ſolid ſtick, like bees-wax; which being cut into ſmall pieces, fit to enter the mouth of a vial, may be preſerved by water, and keeping the glaſs cloſe ſtopped. If the glaſs were not to be ſtopped, the phoſphorus would turn black on its ſurface, and at length be ſpoiled.

The cautions required to make this proceſs ſucceed, are, 1. To evaporate the urine, while it is recent. 2. To prevent its boiling over, and by that means loſing the moſt unctuous part. 3. To let the matter afterwards ferment in the cold. 4. To mix the black matter with the ſand, to prevent its melting and running over. 5. To uſe a ſtone long-neck, thoſe of earth being too porous, and ſuffering the phoſphorus to tranſude ſooner, than paſs into the receiver. 6. To have the receiver very large, and with a very long neck, to prevent its breaking and over-heating, which would either evaporate the white vapour wherein the phoſphorus conſiſts, or elſe prevent its coagulating. 7. To put water into the receiver, for keeping it cool, and quenching the phoſphorus, as it falls to the bottom. 8. To make the fire ſmall at firſt, that the long neck may be preſerved,

ſerved, and the black matter gradually dried; which would otherwiſe ſwell, and run over in a black froth. 9. Laſtly, it is found neceſſary, that the urine for the operation be of ſuch as drink malt-liquors, rather than wine. All theſe circumſtances being required for obtaining the phoſphorus to advantage, it is no wonder that ſo many of thoſe who attempted it, miſcarried.

This operation may be greatly ſhortened, by freezing and concentrating freſh urine; afterwards evaporating it with care; then digeſting it in the manner above-mentioned. When thoroughly digeſted, commit the matter, in a large quantity, to an iron-pot, with an earthen head, as the chemiſts uſually do for making ſpirit of hartſhorn, or the ſpirit and ſalt of urine: and when, by this method, all the ſalt and oil are obtained, let the caput mortuum be taken out, and mixed with twice its own weight of alum. The matter may now be put into well-coated long-necks, and worked with care in a reverberatory furnace, into very large receivers filled with water, and connected to the long-necks by adopters, the lower ends whereof may enter the water, as in diſtilling of quick-ſilver; the operation being continued eight or ten hours. And this is apprehended to be the beſt way, hitherto known, of procuring phoſphorus to advantage.

This phoſphorus has been ſeveral ways diſguiſed, ſo as to make it appear under various forms; ſometimes as a ſolid, ſometimes as a liquid, ſometimes as an ointment, and ſometimes as a running mercury.

Dr. Wall informs us, that Mr. Boyle, being concerned to find how ſmall a proportion of phoſphorus was afforded by urine, deſired him to look out for another ſubject that might afford it in greater plenty. The doctor afterwards cauſing a piece of dry matter to be dug up in the fields where night-men emptied their carts, he obſerved a great number of ſmall particles of phoſphorus therein. This matter the doctor immediately carried to Mr. Boyle, who ſet Bilgar, the chemiſt, to work upon it; but he could obtain very little phoſphorus from it, till another material was added to it in diſtillation; and then he procured phoſphorus in ſuch plenty, that, ſelling large quantities at ſix guineas the ounce, he ſoon became rich, and left England.

The matter which thus fixes and increaſes the phoſphorus is apprehended to be alum, which is itſelf not only in ſome meaſure prepared from urine, but appears to afford the ſame kind of acid that phoſphorus yields by burning; for, upon its analyſis, phoſphorus appears to be a compoſition of a ſtrong acid and inflammable matter, exactly in the manner of common brimſtone, whence it may not improperly be called an animal ſulphur: and accordingly, like common brimſtone, it will burn under a glaſs-bell, and afford flowers that become an acid liquor, like oleum ſulphuris per campanam, by attracting the moiſture of the air.

This phoſphorus has been employed for making curious experiments, a few whereof we ſhall here exhibit, from Dr. Shaw. 1. The light of this phoſphorus appears greater in vacuo than in the open air. 2. In hot weather it is obſerved to dart flaſhes of light through the water wherein it is contained, ſo as exactly to reſemble lightning; which thus darts unextinguiſhed through watery clouds and vapours. 3. Theſe flaſhes of light are not apt to kindle or burn any combuſtible matter, in which they reſemble the harmleſs kind of lightening; but in a condenſed ſtate this phoſphorus burns very furiouſly, and with a moſt penetrating fire, ſo as to melt and diſſolve metals: in which reſpect it again reſembles the more deſtructive kinds of lightening, which are found to have the ſame effects. 4. If a little piece of this phoſphorus be viewed through a microſcope, the internal parts appear in a conſtant ebullition. 5. Though this phoſphorus appears to be a kind of ſulphur, yet it does not diſſolve in highly rectified ſpirit of wine, but communicates ſome ſulphureous parts thereto; for, if this ſpirit be poured into water in the dark, it yields a faint degree of light. 6. This phoſphorus, being mixed with a large quantity of pomatum, makes a ſhining unguent, which may be rubbed on the hands and face, without danger of burning, ſo as to render them luminous in the dark.

Many other ſurpriſing experiments may be made with this phoſphorus, which is a ſubſtance that ſeems in chemiſtry to be much ſuch a thing as the loadſtone in natural philoſophy; and its effects almoſt as odd and difficult to explain, for want of knowing the latent properties of bodies

There are other different kinds of artificial phosphori, of which we shall only mention two, discovered by Mr. Homberg. The first is that usually called the black phosphorus, now commonly prepared with alum and wheat flour (five parts of the former to one of the latter) calcined together to a brownish or blackish mass; which being powdered and set in a phial loosely stopped, in a sand-heat, so as to continue glowing for some time; then removing the whole from the fire, and suffering it to cool gradually, and at last stopping the bottle close, it should be kept in a dark and dry place. A little of this powder being exposed to the open air, immediately takes fire, and appears like a glowing coal: and it is remarkable, that it may be made of any animal or vegetable substance, instead of wheat flour; but that no salt can be substituted instead of alum.

Mr. Homberg's other phosphorus is made of one part of sal ammoniac, and two parts of lime, slaked in the air; mix these well together, and fill a small crucible with them; set this in a small fire of fusion, and as soon as the crucible is red hot, the mixture will melt, and should be stirred with an iron rod to prevent its running over. When the matter is entirely fused, pour it into a brass-mortar, and when cool it will appear of a grey colour, and as if vitrified; if now it be struck upon with any hard body, it appears as on fire in the whole extent of the stroke; but the matter being brittle, it is proper for the experiment's sake, to dip little bars of iron or copper into the melted matter in the crucible; for thus they will be enamelled as it were with the matter, and these bars being struck upon will give the same fire, and the experiment may be several times repeated before all the matter falls off. These bars must be kept in a dry place, to prevent the phosphorus upon them from running, by the moisture of the air.

Both these phosphori were discovered by accident; the first, in searching for a limpid oil from the common stercoracious matter that should fix quicksilver; and the second, by endeavouring to calcine sal ammoniac with lime, so as to render it fusible like wax; which end was obtained, but not the other.

PHOTINIANS, a sect of christians in the fourth century, so called from Photinus, their chief, who was bishop of Sirmich, and maintained that Jesus Christ was true man, but not true God, nor born before all ages; and that he only began to be Christ when the Holy Spirit descended upon him in the river Jordan. These doctrines were condemned in several assemblies, and particularly by the Arians, in a synod held at Sirmich in the year 351.

PHRASE, φρασις, in grammar, a manner of speech peculiarly adapted to certain occasions, arts, languages, &c.

Sometimes the term phrase is used for a short sentence. See SENTENCE.

PHRASEOLOGY, in matters of literature, a collection of the phrases, and elegant expressions, in any language.

PHRENES, φρενες, in anatomy, the name by which Hippocrates, and the antient physicians, called the diaphragm, as supposing it to be the seat of the rational soul. See the article DIAPHRAGM.

PHRENETIC VESSELS, in anatomy, the nerves, arteries, and veins which are spread over the diaphragm. The phrenetic nerves arise from the cervical ones; the phrenetic arteries arise out of the descending aorta, and are distributed thro' the diaphragm and pericardium; and the two phrenetic veins discharge their contents into the vena cava.

PHRENITIS, or PHRENSY, in medicine. See the next article.

PHRENSY, φρενιτις, in medicine, an inflammation of the membranes of the brain, attended with an acute fever and delirium.

A primary phrensy is preceded by heat, and a violent inflammatory pain within the head, a redness of the eyes and face, unquiet and troubled sleep, a slight degree of folly, watching, sadness, fierceness, sudden forgetfulness, and a gathering of threads from the bed-cloaths: whereas a symptomatic phrensy succeeds any acute disease, but is worst when preceded by an inflammation of the pleura, lungs, or diaphragm.

A black tongue, an obstinate costiveness, white fæces (which is always a fatal sign) a wildness in the looks and actions, &c. are signs of an approaching phrensy; which is generally fatal on the third, fourth, or seventh day, which last it seldom exceeds: when it does, and is violent, the patient becomes raving mad; and it often terminates in a lethargy, coma, or catoche.

This disease, says Arbuthnot, requires the speediest applications of all others; profuse

profuse hæmorrhages of the nose often resolve it; and copious bleeding in the temporal arteries, is the most efficacious remedy. The diet should be water-gruel, acidulated; and the drink barley-water, small-beer, or the decoction of tamarinds.

According to Boerhaave, varices of the veins, or the bleeding-piles, are beneficial: a loosenefs is likewise good; and a violent cough, or hæmorrhage, often put an end to the disease. He therefore advises plentiful bleeding, through a large orifice, or to open several veins at the same time, as the jugular, frontal, and a vein in the foot.

Hoffman, from experience, prefers bleeding at the nose, procured by thrusting up a straw, a pen, or a skewer. But if this disease proceeds from a suppression of the lochia or menses, speedy and copious bleeding in the foot is necessary: and if from a stoppage of the bleeding piles, leeches must be applied to the hæmorrhoidal veins. After bleeding, cathartics are proper; among which, the following is preferable to all others: take of manna, four ounces; of cream of tartar, two drams; of nitre, half a dram; of oil of sweet almonds, an ounce: all which are to be taken in a pound of whey. The drink also should be fresh whey. Emulsions of the four cold seeds with barley-water, adding to every quart two scruples of nitre, are also convenient.

Externally, warm baths are proper for the feet; or linen-cloths may be dipped in hot-water, and applied to the feet. But especially let the head be shaved all over, and embrocated with a mixture of the best vinegar, two ounces; camphorated spirit of wine, two drams; purified nitre, two scruples; and oil of rhodium-wood, twenty drops. Antiphlogistic clysters are also proper.

But if all these means fail, recourse must be had to cupping in the lower parts, to opiates and mild blisters: though Hoffman thinks the two latter hurtful; and Boerhaave advises the physician to consider well, if the case be symptomatical, how far the foregoing method, or any part of it, is consistent with the primary disease.

PHRYGANEA, in zoology, a genus of insects of the order of the neuroptera, the palate whereof is prominent, with two tentacula on each side; the wings are incumbent; and the worm of it lives under water in a kind of case.

PHRYGIA, the Greater and Lesser, two provinces antiently of Asia Minor; having the Hellespont on the north.

PHTHIRIASIS, φθειρίασις, in medicine, the pedicularis morbus, or lousy disease, is most incident to children, though adults are not wholly exempt from it.

Cleanness and wholesome food are best for preventing this disorder, which may be cured by washing the body with a lixivium of wormwood, staves-acre, lesser centaury, and oak-ashes; adding some common salt. All the bitters, sour and salt things, are here recommended; as is also mercury, which infallibly destroys these vermin; but it ought to be used with great caution, even by adults, and should never be used in applications to children.

Etmuller advises the head to be washed with a lixivium, in which has been boiled the seeds of staves-acre, and afterwards anointed with a liniment made of two drams of oil of spike, half an ounce of the oil of bitter-almonds, and six drams of the oil of tobacco, which will destroy those animals in one night's time. The powder of indian-berries, sprinkled on the head, also effectually destroys them. Black soap is an infallible remedy for destroying crab-lice lodged in the groins of adults.

PHTHISIS, φθίσις, a species of consumption, arising from an ulcer of the lungs. See the article CONSUMPTION.

The sign of an approaching phthisis, according to Morton, is a dry cough, which may continue for some months; whereas a simple catarrh is attended with spitting, and is but of short duration. Vomiting, or a disposition to vomit after eating, excited by the above-mentioned cough, is a most certain sign of a phthisis.

The effects of an ulcer of the lungs already formed, but concealed under the name of a vomica, are chiefly these; a purulent consumption of the whole lungs, or one of its lobes; a continual dry cough; the bursting of the vomica; the sometimes suffocating discharge of the pus, or the daily coughing up of matter, which sinks in water, and is thick, fœtid, white, red, yellow, livid, or streaked; and which, put into the fire, has the smell of burnt flesh. Sometimes the vomica breaks into the cavity of the thorax,

thorax, which is what phyficians call an empyema. See EMPYEMA.

If the purulent matter is allowed to enter the blood, the refpiration becomes exceeding bad; the chyle, and the whole mafs of blood, are converted into pus; the ufual method of nourifhment is deftroyed; the folids continually wafte away; a hectic fever appears, with nocturnal fweats, fwelling of the feet and hands, and diarrhœa of purulent cadaverous ftools, which generally end in death.

As to the cure, Boerhaave's method is this: when a vomica is known to be formed in the lungs, the phyfician muft endeavour to ripen it, which is done by a milk diet, riding on horfe-back, warm vapours, and expectorant medicines. The blood muft be defended againft the purulent infection, by moderately acid and faltifh remedies, vulnerary herbs, and balfamics, given in various forms, in great plenty, and continued a long time. The ulcer muft be cleanfed and healed by liquid medicines, and fuch things as promote coughing, by motion, riding, and good air. The cleanfers are detergent balfamics, ufed inwardly and outwardly; and the confolidaters are paregorics. The aliment fhould be eafy of digeftion: butter-milk is excellent; as are alfo affes-milk, ptifans, broths and lacticinia.

Sydenham advifes, at firft, bleeding and gentle purging, to diminifh the defluxion on the lungs; then pectorals, and fuch medicines as temperate the hectic fever, with emulfions, and affes-milk. See the article HECTIC.

And, laftly, he directs the ulcer to be healed with balfamics, as opobalfamum, the dofe being twenty drops upon fugar; but this is not to be taken before due evacuations have been firft made: but, above all, he recommends riding; which, he fays, as certainly cures a confumption, as the peruvian bark does intermitting fevers.

But as confumptions are fo common as to make above a tenth part of the bills of mortality in London, we fhall give Morton's method of treating them. In the firft ftage, when the perfon is afflicted with a continual cough, efpecially in the night time, the defluxion upon the lungs is to be ftopped by bleeding, by repeated draughts of oxymel of fquills and oil of fweet-almonds, of each an ounce, to be taken in large draughts of poffet-drink; after which an opiate, made of two ounces of the fimple alexiterial water, half an ounce of fimple cinnamon-water, and fix drams of the fyrup of poppies will be proper; or the patient may take fix or ten of the ftorax-pills. It will alfo be convenient to carry down the impurities by ftool, with a gentle cathartic. Diaphoretics likewife are not to be neglected; nor muft thofe remedies that foften, lubricate, thicken, and concoct the phlegm be omitted; as fugar-candy, barley-fugar, old conferve of rofes, liquorice-juice, the white and black troches of the London-difpenfatory, frefh-butter in water-gruel, fweet-oil, oil of fweet-almonds, and efpecially linfeed-oil cold drawn, of which the patient may take a fpoonful every hour, unlefs there is a diarrhœa, or other fymptom that forbids it. He may alfo eat raifins and figs, and ufe the other medicines commonly prefcribed for coughs. See the article COUGH.

In the fecond ftage, when the vomica is formed, but not fuppurated, evacuations of all kinds are pernicious. The patient fhould continue the ufe of the pectoral medicines, and efpecially the balfamic pills, milk-diet, and the chalybeate-waters; of which he fhould drink only four, or at moft fix pints in a day, and a little at a time: and this courfe fhould be continued for feveral years.

But whether a milk-diet be ufed alone, or mixed with mineral-waters, Hoffman thinks it highly neceffary to attend to the following particulars: 1. We ought diligently to enquire whether the ftrength of the ftomach is fufficient to digeft and again expel this fpecies of medicine. 2. It is expedient that, before the ufe of the milk, the primæ viæ fhould be well cleanfed from vifcid and acid humours; which intention is moft effectually anfwered by a laxative infufion of manna, whofe virtue is augmented by adding a fufficient quantity of tartar. 3. On the firft days, it is expedient every morning about fix or feven, and every afternoon, about five o'clock, to drink fix or eight ounces of women's or affes-milk, and afterwards gradually to increafe the quantity. 4. After the patient has for fix or eight days drank the milk in this manner, a gentle laxative medicine, and fuch as has a tendency to evacuate the fordes, is to be interpofed and repeated every fixth day. 5. He ought never to ufe wine or malt-liquors for drink, but rather

rather ptisans of barley, hartshorn, and citron-peel. He must also carefully abstain from aliments of hard digestion, and such as generate bad juices. On the contrary, broth prepared of tortoises, cray-fish, veal, fowls, lettuce, and garden succory, are of singular service. 6. In order to augment the concoctive force of the stomach, which in a phthisis is very languid, it is expedient between meals to exhibit some balsamic pectoral, and stomachic elixir, such as that made of the best myrrh, saffron, nutmegs, orange-peel, marsh-trefoil, and liquorice-root.

As to the pectoral and vulnerary balsams, the forms recommended by the most celebrated physicians are, according to the same author, the following ones.

Take of the oil of St. John's wort, two ounces; of sperma-ceti, six drachms; of the best venice-turpentine, three drachms; of dragon's-blood, one drachm; and of laudanum-opiatum, six grains: mix all together, and let the dose be from one to two drachms.

Nor, says he, have I found the following balsam less efficacious: take of the oil of sweet-almonds, two ounces; and of the flowers of sulphur, sublimed by quicklime, two drachms: boil over a gentle fire; then add, of the balsam-capivi, one drachm; of sperma-ceti and bees-wax, each half an ounce; of the extract of saffron, half a drachm; and of the oils of anise, fennel, and mace, each ten drops.

Another balsam for answering the same end may be prepared thus: take, of the best prussian honey and mountain diacodium, each one ounce; of the aqueous essence of myrrh inspissated, half an ounce; of the flowers of sulphur, and the extract of the tops of yarrow, each two drachms; of the extract of saffron, half a drachm; and, of the oils of mace and sassafras-wood, each eight drops.

These noble and efficacious balsams, when their use is indicated, cannot be exhibited in a better or more proper vehicle, than a sufficient quantity of the milk of asses, goats, or cows.

In colliquative sweats, Morton recommends the free use of pearl-julep; to which may be added chalk, coral, dragon's blood, or other absorbents: the patient should not be allowed to sleep too long, and the bed-clothes should be lighter.

As for symptomatic consumptions, arising from a gonorrhœa, the fluor-albus, a diarrhœa, &c. the method of cure will be found under the articles GONORRHOEA, FLUOR-ALBUS, &c.

PHYGETHLON, in surgery, a broad, but not much elevated tumour, of the same nature with the bubo. See the article BUBO.

PHYLACTERY, in antiquity, a charm, or amulet, which being worn, was supposed to preserve people from certain evils, diseases, and dangers. See the article AMULET.

The Jews were remarkable for wearing phylacteries of parchment, in the form of slips or rolls, wherein were written certain passages of the law: these they wore upon their foreheads, and upon the wrists of their left arms. The modern Jews think themselves under no obligation to this practice, which they observe only at morning prayers.

PHYLLANTHUS, in botany, a genus of the monoecia-triandria class of plants, without any flower petals: the calyx is monophyllous, campanulated, and divided into six parts: the fruit is a roundish capsule, with three cells, in each of which is a single seed.

PHYLLIS, in botany, a genus of the pentandria-digynia class of plants, the corolla of which consists of five lanceolated and obtuse petals, just cohering at their bases: the fruit is of a turbinato-oblong, obtuse, and angular figure, composed of two parallel seeds.

PHYLLONA, in botany, a genus of mosses, consisting only of a thin membranaceous matter, resembling in some degree a leaf; whence the name. See the article MOSS.

PHYMA, in surgery, any kind of tumour. See the article TUMOUR.

PHYSALIS, or ALKEKENGI, in botany. See the article ALKEKENGI.

PHYSETER, in ichthyology, the name of a genus of fishes of the order of the plagiuri, having teeth only in the lower jaw that are crooked; on the back there is a fin, of a large and tall spine; and the opening or fistula for the discharge of the water is in the front part of the head. See the article PLAGIURI.

This genus comprehends the crooked-toothed whale, and the plane-toothed whale. See the article WHALE.

PHYSETER is also a species of balæna, or whale, with the fistula in the middle of the head, and a pinniform tuberosity on the

the back: it is equal in length to the greenland-whale, but not a third of its thicknefs.

PHYSIC, φυσικη, the fame with medicine. See the article MEDICINE.

PHYSICAL, fomething relating to nature. See the articles NATURE and NATURAL PHILOSOPHY.

PHYSICIAN, a perfon who profeffes medicine, or the art of healing difeafes. See MEDICINE and DISEASE.

For an account of the college of phyficians in London, fee the article COLLEGE.

PHYSICS, a denomination fometimes given to natural philofophy. See the article NATURAL PHILOSOPHY.

PHYSIOGNOMONICS, among phyficians, denote fuch figns as being taken from the countenance, ferve to indicate the ftate, difpofition, &c. both of the body and mind: and hence the art of reducing thefe figns to practice is termed phyfiognomy, than which nothing can be more precarious, in fo far as it refpects the characters of people accuftomed by education and practice to diffemble their fentiments.

PHYSIOLOGY, properly denotes a difcourfe of nature, and natural bodies; or, it is that part of natural philofophy which treats of the various phænomena of nature in a fcientifical and fpeculative way; in which fenfe, neither chemiftry nor experimental philofophy are included under it. However, as experiments ought always to precede any reafonings concerning the natures and properties of natural bodies, we have given the rules to be obferved in drawing conclufions from them under the article EXPERIMENTAL PHILOSOPHY.

If we take a view of the feveral phænomena, and compare them together, we may obferve fome likenefs and conformity between them. For example, in the falling of a ftone to the ground, in the rifing of the fea towards the moon, in cohefion and cryftallization, there is fomething alike; namely, an union or mutual approach of bodies: fo that any one of thefe, or the like phænomena, may not feem ftrange or furprifing to a man who has nicely obferved and compared the effects of nature: for that only is thought fo which is uncommon, or a thing by itfelf, and out of the ordinary courfe of our obfervation. That bodies fhould tend towards the center of the earth is not thought ftrange, becaufe it is what we perceive every moment of our lives; but that they fhould have a like gravitation towards the center of the moon, may feem odd and unaccountable to moft men, becaufe it is difcerned only in the tides; but a philofopher, whofe thoughts take in a larger compafs of nature, having obferved a certain fimilitude of appearances, as well in the heavens as the earth, that argue innumerable bodies to have a mutual tendency towards each other, which he denotes by the general name attraction, whatever can be reduced to that he thinks juftly accounted for; and thus he explains the tides by attraction. See the articles ATTRACTION and TIDES.

If therefore we confider the difference there is betwixt natural philofophers and other men, with regard to their knowledge of the phænomena, we fhall find it confifts only in a greater largenefs of comprehenfion; whereby analogies, harmonies, and agreements are difcovered in the works of nature, and the particular effects explained; that is, reduced to general rules, which rules, grounded on the analogy and uniformnefs obferved in the production of natural effects, are moft agreeable and fought after by the mind; for that, they extend our profpect beyond what is prefent and near to us, and enable us to make very probable conjectures touching things that may have happened at very great diftances of time and place, as well as to predict things to come; which fort of endeavour towards omnifcience, is much affected by the mind.

Among phyficians, the term phyfiology denotes the hiftory of the human body and its feveral conftituent parts, with their relations and functions.

PHYTEUMA, CRETIC RAMPIONS, in botany, a genus of the pentandria-monogynia clafs of plants, the flower of which is compofed of a fingle ftellated petal: the fruit is a roundifh capfule, and contains three cells, with numerous feeds.

PHYTOLACCA, in botany, a genus of the decandria-decagynia clafs of plants, the corolla whereof confifts of five roundifh, hollow, patent petals: the fruit is an orbiculated depreffed berry, with ten longitudinal furrows, and as many cells, in each of which is a fingle kidney-fhaped feed.

PHYTOLOGY, a difcourfe concerning the kinds and virtues of plants.

PIA MATER, in anatomy, the third tunic or membrane of the brain, placed immediately

mediately under the tunica arachnoides, and closely and firmly connected to the brain: it not only extends over the whole surface of the brain, but insinuates itself into all its cavities, and is carried down to the bottom of all its furrows. It covers also the spinal marrow, and all the nerves, and adheres also to the tunica arachnoides very closely and firmly, in the upper part of the head; but much less so below, with the dura mater.

Its blood vessels are common to the rest of the brain, and are very numerous; so that it seems in a manner wholly composed of them. The arteries are from the internal carotids and vertebrals: some of the veins discharge themselves into the sinuses of the dura mater, and others immediately into the jugular and vertebral veins. The use of the pia mater is to support the blood vessels of the brain, which it also serves as a covering to, that they may be the more conveniently distributed through all its furrows and anfractuosities; for secreting proper fluids in the brain, and forming the animal spirits.

PIACE, SE PIACE, or AD LIBITUM, in the italian music, signifies, that the part it is joined to may be repeated or not, at pleasure.

PIACENZA, or PLACENTIA. See the article PLACENTIA.

PIACHE, or PIAZZA. See PIAZZA.

PIANOSA, an island of Italy, in the Tuscan sea, situated a little south-west of the isle of Elba, and subject to Tuscany, east long. 11°, north lat. 42° 36′.

PIASTER, a spanish coin, more ordinarily called a piece of eight. See the article *Spanish* COINS.

PIAVA, a river of Italy, which rises in Tyrol, and falls by two mouths into the gulph of Venice.

PIAZZA, in building, a portico, or covered walk, supported by arches. See the article PORTICO.

PICA, in zoology, the largest animal of the mus, or mouse kind, being as big as a pig of a week old: it is of a brown colour spotted with grey, and with a white belly; the upper lip is divided, and a little longer than the under one; the ears are short, and obtuse; the body is thick and fleshy, and the legs short, especially the fore ones. See plate CXCIX. fig. 1.

It is a native of the East-Indies, and South-America; its voice is like that of a hog, and it strikes with the head in the manner of that animal, and raises the bristles on the back when angry: hence, Ray calls it mus brasiliensis magnus, porcelli pilis et voce.

PICA, in medicine, a depravation of appetite, which makes the patient long for what is unfit for food, or incapable of nourishing, as chalk, ashes, coals, plaster, lime, &c. See MALACIA.

PICÆ, in ornithology, a class of birds, which have the beak convex and compressed.

This class comprehends several genera; as, the ramphastos, buceros, corvus, picus, &c. See RAMPHASTOS, &c.

PICARDS, a sect so called from their leader, one Picard, a Fleming, who, about the beginning of the fifteenth century, improved upon the error of the Adamites, in respect to nakedness; and who pretended that he was sent into the world, as another Adam, to restore the law of nature, which, he said, consisted principally of two things, a community of women, and a nakedness of all the parts of the body.

PICARDY, a province of France, bounded by the french Netherlands and the Streights of Dover, on the north and east; by the isle of France, on the south; and by Normandy and the English channel, on the west.

PICIGHITONE, a town of Italy, in the dutchy of Milan, thirty-three miles south-east of the city of Milan.

PICKAGE, or PICCAGE, an antient custom or duty paid at fairs and markets, for breaking the ground, and pitching up stalls or standings.

PICKEERING, or PICQUEERING. See the article PICQUEERING.

PICKERING, a market-town of Yorkshire, twenty-two miles north-east of York.

PICKET, PICQUET, or PIQUET, in fortification, a painted staff shod with iron; used in marking out the angles and principal parts of a fortification, when the engineer is tracing out a plan upon the ground.

There are also larger pickets, or painted stakes, which are driven into the earth to hold together fascines or faggots, in any work cast up in haste.

Pickets are likewise the stakes driven into the ground near the tents of the horsemen in a camp, to tie their horses to; and before the tents of the foot, where they rest their musquets or picks about them in a ring. The same name is also given to

to the stakes with notches towards the top, to which are fastened the cordages of tents: thus to plant the picket is to encamp. When a horseman has committed any considerable offence, he is sometimes sentenced to stand upon the picket, which is to have one hand and the opposite foot tied together, and being drawn up from the ground by the other hand, he is obliged to stand with one foot on the point of a picket or stake, so that he can neither stand nor hang without great pain, nor ease himself by changing feet.

PICKET-GUARD. See PICQUET-GUARD.

PICKLE, a brine or liquor, commonly composed of salt, vinegar, *&c.* sometimes with the addition of spices, wherein meat, fruit, and other things are preserved and seasoned. The same name is also given to any vegetable production prepared in pickle.

The methods of pickling the various sorts of vegetables, and even those of the same kind, are very different: we shall therefore content ourselves with giving one out of the numerous methods of pickling walnuts: Take walnuts before the shell is grown hard, scald them, and rub off the outer skin; then put them into water and salt for nine or ten days, shifting them every other day, and keeping them close covered from the air; then dry them, and prepare the pickle as follows: For half an hundred of large walnuts, take two quarts of white-wine vinegar; long pepper, black pepper, and ginger, of each half an ounce; cloves, mace, and nutmegs, of each a quarter of an ounce: pound the spice, and with it a spoonful of mustard-seed; strew this between every layer of walnuts, pour the liquor boiling hot upon them, and keep them close stopped.

Broom-buds, capers, and olives are pickled with oil and vinegar.

Pickles on being imported pay a duty of $7\frac{18\frac{1}{4}}{100}$d. the gallon, and, on exportation, draw back, $6\frac{46\frac{1}{4}}{100}$d.

PICO, one of the azores islands, situated in the atlantic ocean: west long. 20°, north lat. 39°, subject to Portugal.

PICQUEERING, PICKEERING, or PICKEROONING, a flying war or skirmish made by soldiers detached from two armies for pillage, or before a main battle begins.

PICQUET, a celebrated game at cards played between two persons, with only thirty-two cards; all the duces, threes, fours, fives, and sixes being set aside.

In playing at this game twelve cards are dealt to each, and the rest laid on the table: when if one of the gamesters find he has not a court-card in his hand, he is to declare that he has carte blanche, and tell how many cards he will lay out, and desire the other to discard, that he may shew his game, and satisfy his antagonist, that the carte blanche is real; for which he reckons ten. And here the eldest hand may take in three, four or five, discarding as many of his own for them, after which the other may take in all the remainder if he pleases. After discarding, the eldest hand examines what suit he has most cards of; and, reckoning how many points he has in that suit, if the other has not so many in that, or any other suit, he reckons one for every ten in that suit, and he who thus reckons most is said to win the point. It is to be observed, that in thus reckoning the cards, every card goes for the number it bears; as a ten for ten; only all court-cards go for ten, and the ace for eleven, and the usual game is one hundred up. The point being over, each examines what sequences he has of the same suit, *viz.* how many tierces, or sequences of three cards; quartes, or sequences of four cards; quintes, or sequences of five cards, *&c.* he has. These several sequences are distinguished in dignity by the cards they begin from: thus, ace, king, and queen, are stiled tierce major; king, queen, and knave, tierce to a king; knave, ten, and nine, tierce to a knave; and the best tierce, quarte, or quinte prevails, so as to make all the others in that hand good, and to destroy all those in the other hand. In like manner a quarte in one hand sets aside a tierce in the other.

The sequences over, they proceed to examine how many aces, kings, queens, knaves and tens each holds; reckoning for every three of any sort, three; but here too, as in sequences, he that with the same number of threes or fours, has one that is higher than any the other has, makes his own good, and sets aside all his adversary's; but four of any sort, which is called a quatorze, because fourteen are reckoned for it, always set aside three.

The game in hand being thus reckoned, the

the eldeft proceeds to play, reckoning one for every card he plays above nine, while the other follows him in the fuit: but unlefs a card be won by one above nine, except it be the laft trick, nothing is reckoned for it. The cards being played out, he that has moft tricks reckons ten for winning the cards: but if they have tricks alike, neither reckons any thing. If one of them wins all the tricks, inftead of ten, which is his right for winning the cards, he reckons forty, and this is called capot.

The deal being finifhed, each perfon fets up his game: they then proceed to deal again as before; cutting afrefh each time for the deal: if both parties are within a few points of being up, the carte blanche is the firft that reckons, then the point, then the fequences, then the quatorzes, then the tierces, and then the tenth cards. He that can reckon thirty in hand by carte blanche, points, quintes, &c. without playing, before the other has reckoned any thing, reckons ninety for them, and this is called a repike; and if he reckons above thirty, he reckons fo many above ninety. If he can make up thirty, part in hand, and part in play, before the other has told any thing, he reckons for them fixty; and this is called a pique, whence the name of the game. Mr.de Moivre, in his doctrine of chances, has refolved, among others, the following problems: 1. To find, at picquet, the probability which the dealer has for taking one ace or more in three cards, he having none in his hands. He concludes from his computation, that it is 29 to 28 that the dealer takes one ace or more. 2. To find at picquet the probability which the eldeft has of taking an ace or more in five cards, he having no ace in his hands. Anfwer; 232 to 91, or 5 to 2, nearly. 3. To find at picquet the probability which the eldeft has of taking both an ace and a king in five cards, he having none in his hand. Anfwer; the odds againft the eldeft hand taking an ace and a king are 331 to 315, or 21 to 20 nearly. 4. To find at picquet the probability of having twelve cards dealt to, without king, queen, or knave; which cafe is commonly called cartes blanches. Anfwer; the odds againft cartes blanches are 323 to 578956, or 1791, to 1 nearly. 5. To find how many different fets effentially different from one another, one may have at picquet before taking in. Anfwer; 28,967,278. This number falls fhort of the fum of all the diftinct combinations, whereby twelve cards may be taken out of 32, this number being 225,792,840; but it ought to be confidered, that in that number feveral fets of the fame import, but differing in fuit, might be taken, which would not introduce an effential difference among the fets.

PICRA, or Hiera Picra. See the article Hiera Picra.

PICRIS, *langue de beuf*, in botany, a genus of the fyngenefia-polygamia-æqualis clafs of plants, the compound flower of which is imbricated and uniform, with equal and numerous hermaphrodite corollulæ; the partial flower is monopetalous, ligulated, lineated, truncated, and quinquedentated; there is no pericarpium; the feed, which is contained in the cup, is fingle, ventricofe, obtufe, and crowned with a plumofe pap.

PICTS-wall, in antiquity, a wall begun by the emperor Adrian, on the northern bounds of England; to prevent the incurfions of the Picts and Scots. It was firft made only of turf, ftrengthened with palifadoes, till the emperor Severus coming in perfon into Britain built it with folid ftone. This wall, part of which ftill remains, begun at the entrance of Solway-frith in Cumberland, and running N. E. extended to the German ocean.

PICTURE, a piece of painting, or a fubject reprefented in colours, on wood, canvas, paper, or the like.

Pictures four feet fquare, or containing 16 fuperficial feet, or upward, on being imported pay 3 l. thofe of two feet fquare, or four fuperficial feet, and under 16 feet, pay 2 l. and thofe under two feet fquare, or four fuperficial feet, pay 1 l.

PICUS, the Wood-pecker, in ornithology. See the article Wood-pecker.

PIECE, in commerce, fignifies fometimes a whole, and fometimes a part of the whole. In the firft fenfe, we fay a piece of cloth or velvet, &c. meaning a certain quantity of yards regulated by cuftom; being yet entire, and not cut. In the other fignification we fay a piece of tapeftry; meaning a diftinct member wrought apart, which, with feveral others, make one hanging.

Piece, in matters of money, fignifies fometimes the fame thing with fpecies; and fometimes by adding the value of the pieces, it is ufed to exprefs fuch as have no other particular name. For the piece of eight or piaftre, fee Coin.

PIECE is alſo a kind of money of account, or rather a manner of accounting uſed among the negroes on the coaſt of Angola in Africa. See the article MONEY.

PIECE, in heraldry, denotes an ordinary or charge. See the articles ORDINARY and CHARGE.

The honourable pieces of the ſhield are the chief, feſſe, bend, pale, bar, croſs, ſaltier, chevron, and in general all thoſe which may take up one third of the field, when alone, and in what manner ſoever it be. See CHIEF, FESSE, &c.

PIECES, in the military art, include all ſorts of great guns and mortars. Battering pieces are the larger ſort of guns uſed at ſieges for making the breaches, ſuch are the twenty-four pounder, and culverine, the one carrying twenty-four, and the other an eighteen, pound-ball. Field pieces are twelve-pounders, demiculverines, ſix-pounders, ſakers, minions, and three-pounders, which march with the army, and encamp always behind the ſecond line, but in day of battle are in the front. A ſoldier's firelock is likewiſe called his piece.

PIED DE PORT, *St.* JOHN, a town of France, in the province of Gaſcony, at the foot of the Pyrenees, ſituated ſixteen miles ſouth of Bayonne.

PIEDMONT, a principality of Italy, ſo called from its lying at the foot of the Alps. It is bounded by Savoy, from which it is ſeparated by the Alps on the north, by the dutchies of Milan and Montferrat on the eaſt, by the territories of Genoa and the county of Nice on the ſouth, and by France on the weſt; being about 100 miles long and 70 broad.

PIEDOUCHE, in architecture, a little ſtand or pedeſtal, either oblong or ſquare, enriched with mouldings, ſerving to ſupport a buſt, or other little figure.

PIEDROIT, in architecture, a pier or ſquare kind of pillar, part whereof is hid within a wall. The only thing wherein it differs from a pilaſter is, that the latter has a regular baſe and capital, which the other wants. See PILASTER. This term is alſo uſed for part of the ſolid wall annexed to a door or window, comprehending the door-poſt, chambranle, tableau, leaf, &c.

PIENZA, a town of Italy, in the dutchy of Tuſcany and territory of Sienna, twenty eight miles ſouth-eaſt of Sienna.

PIEPOWDER COURT, or PEDES PULVERISATI, a court held in fairs for doing juſtice to buyers and ſellers, and redreſſing diſorders there committed. It is ſo called, as being moſt uſually held in the ſummer, when the ſuitors to the court have duſty feet, &c. This is a court of record, incident to every fair, and is to be held only during the time the fair is kept. For its juriſdiction, the cauſe of action on any contract, &c. muſt ariſe in the ſame fair, or market, and not before at a former fair, not after the fair, and be done, complained of, heard, and determined, the ſame day. The ſteward is judge, and the trial is by merchants and traders in the fair, and judgment againſt the defendant ſhall be that he be amerced, &c.

PIER, or PEER, in building, denotes a maſs of ſtone, &c. oppoſed by way of fortreſs againſt the force of the ſea, or a great river, for the ſecurity of ſhips that lie at harbour in any haven.

It is alſo uſed in architecture for a kind of pilaſter, or buttreſs, raiſed for ſupport, ſtrength, and ſometimes for ornament.

PIERCED, PERCE', in heraldry, is when any ordinary is perforated, or ſtruck through, ſhewing, as it were, a hole in it, which muſt be expreſſed in blazon, as to its ſhape: thus if a croſs have a ſquare hole, or perforation in the centre, it is blazoned ſquare-pierced, which is more proper than quarterly-pierced, as Leigh expreſſes it. When the hole or perforation is round, it muſt be expreſſed round-pierced; if it be in the ſhape of a lozenge, it is expreſſed pierced lozengeways. All piercings muſt be of the colour of the field, and when ſuch figures appear on the centre of a croſs, &c. of another colour, the croſs is not to be ſuppoſed pierced, but that the figure on it is a charge, and muſt be accordingly blazoned.

PIERCING, among farriers. To pierce a horſe-ſhoe lean, it is to pierce it too near the edge of the iron: to pierce it fat, is to pierce it farther in.

St. PIERRE DE MONTIER, a town of France, in the province of Orleans, and territory of Nivernois, ſituated ten miles ſouth of Nevers.

PIETANTIA, or PITTANCE, a portion of victuals diſtributed to the members of a college, or other community, upon ſome great feſtivals.

PIETISTS, a religious ſect ſprung up among the proteſtants of Germany, ſeeming to be a kind of mean between the quakers of England, and the quietiſts of

of the Romiſh church. See the article QUAKERS, &c.

They deſpiſe all ſorts of eccleſiaſtical polity, all ſchool theology, and all forms and ceremonies, and give themſelves up to contemplation and the myſtic theology.

PIEVE DE CUDORE, or CONDORE, a town of Italy, in the territory of Venice, capital of the province of Cadorin, in eaſt long. 12° 30′, north lat. 46° 40′.

PIG, in zoology, the young of the hog kind. See the article HOG.

Guinea-PIG. See the article GUINEA-PIG.

PIG *of lead*, the eighth part of a fother, amounting to two hundred and fifty pounds weight.

PIGEON, in ornithology. See the article COLUMBA.

PIGEON-HOUSE, a houſe erected full of holes within for the keeping, breeding, &c. of pigeons, otherwiſe called a dovecote.

Any lord of a manor may build a pigeon-houſe on his land, but a tenant cannot do it without the lord's licence. When perſons ſhoot at or kill pigeons within a certain diſtance of the pigeon-houſe, they are liable to pay a forfeiture.

PIGMENTS, *pigmenta*, preparations uſed by painters, dyers, &c. to impart colours to bodies, or to imitate particular colours.

When glaſs is ſtained and coloured, as in painting on glaſs, or for counterfeiting gems, or precious ſtones, the pigment is always of a metalline or mineral nature. See the article COLOUR, &c.

PIGNEROL, a town of Italy, in the province of Piedmont, ſituated on the river Chizon, ten miles ſouth-weſt of Turin.

PIGUS, in ichthyology, a ſpecies of the cyprinus. See the article CYPRINUS.

This fiſh is of the ſame ſhape and ſize with the common carp, and its eyes, fins, and fleſhy palate wholly the ſame. From the gills to the tail there runs a dotted crooked line.

PIGMY, or PYGMY. See PYGMY.

PIKE, an offenſive weapon, conſiſting of a ſhaft of wood, twelve or fourteen feet long, headed with a flat-pointed ſteel, called the ſpear. The pike was a long time in uſe among the infantry, to enable them to ſuſtain the attack of the cavalry, but it is now taken from them, and the bayonet, which fixes on at the end of the carabine is ſubſtituted in its place. Yet the pike ſtill continues the weapon of foot-officers, who fight pike in hand, ſalute with the pike, &c.

PIKE, in ichthyology, the ſame with lucius. See the article LUCIUS.

PIKE-FISHING. See the article FISHING.

PILA, in building, the ſame with pier. See the article PIER.

PILA, among antiquarians, denotes the arms-ſide of a piece of money, which was probably ſo called becauſe it antiently bore the impreſſion of a church built on piles.

PILASTER, in architecture, a ſquare column, ſometimes inſulated, but more frequently let within a wall, and only ſhewing a fourth or fifth part of its thickneſs.

The pilaſter is different in different orders; it borrows the name of each, and has the ſame proportions, and the ſame capitals, members and ornaments with the columns themſelves. Pilaſters are however uſually made without either ſwelling or diminution, and as broad at top as at the bottom; though ſome of the modern architects, as M. Manſard, &c. diminiſh them at the top, and even make them ſwell in the middle, like columns, particularly when placed behind columns.

Mr. Perrault obſerves, that pilaſters, like columns, become of different kinds, according to the different manner in which they are applied to the wall. Some are wholly detached, and theſe Vitruvius calls paraſtatæ; others have three faces clear out of the wall; others two; and others only one; theſe Vitruvius calls antæ. Inſulate pilaſters are but rarely found in the antique; for the chief uſe the antients made of them, was to give the greater ſtrength to the extremities of porticoes.

There are four things to be principally regarded in pilaſters, their projecture out of the wall; their diminution; the diſpoſition of the entablature, when it happens to be common to them and to a column, and their flutings and capitals. 1. Then, the projecture of pilaſters that have only one face out of the wall, ought to be one eighth of their breadth, or at moſt one ſixth; but when they receive impoſts againſt their ſides, the projecture may be a quarter of their diameter. 2. Pilaſters are ſeldom diminiſhed when they have only one face out of the wall: indeed when they ſtand in the ſame line with columns, and the entablature is continued over both, without any break, the pilaſters are to have the ſame dimenſions with

with the columns. 3. Pilafters are fometimes fluted, though the columns that accompany them are not fo; and on the contrary, the columns are fometimes fluted, when the pilafters that accompany them are not. The flutings of pilafters are always odd in number, except in half pilafters, which meet at inward angles, where four flutings are made for three, &c. 4. The proportions of the capitals of pilafters, are the fame as to height with thofe of columns; but they differ in breadth, the leaves of pilafters being much broader; becaufe pilafters, though of equal extent, have only the fame number of leaves for their girt, *viz.* eight. Their ufual difpofition is to have two in each face in the lower row, one in the middle, and two halves in the angles, in the turns of which they meet. Add to this, that the rim of the vafe, or tambour, is not ftrait, as the lower part is; but a little circular and prominent in the middle. See the article FLUTINGS.

In pilafters that fupport arches, the proportions, according to Palladio, fhould be regulated by the light they are placed in; and at the angles by the weight they are to fuftain: they muft not be too tall and flender, left they refemble pillars, nor too dwarfifh and grofs, left they appear like the piers of bridges. In private buildings they ought not to be narrower than one third, nor broader than two thirds of the vacuity, or interfpace between pilafter and pilafter; but as for thofe that ftand at the corners, they may have a little more latitude allowed them, to give the greater ftrength to the angles. Palladio obferves, that in the theatres and amphitheatres, and fuch maffive works, they have been as broad as the half, and fometimes as the whole vacuity or interfpace. He alfo afferts, that their true proportion fhould be an exact fquare; but for leffening of expence, they are ufually made narrower in flank than in front.

PILAW, a port-town of Poland, in the territory of ducal Pruffia, fituated on the Baltic, eaft long. 20°, north lat. 54° 45′, fubject to the king of Pruffia.

PILCHARD, *pilchardus*, in ichthyology, a fpecies of clupea, with the upper jaw bifid, and fpotted on each fide with black. See the article CLUPEA.

PILE, in antiquity, a pyramid built of wood, on which the bodies of the deceafed were laid in order to be burnt.

PILE, in building, is ufed for a large ftake rammed into the ground in the bottom of rivers, or in marfhy land, for a foundation to build upon.

Pile is alfo ufed among architects for a a mafs of building.

PILE, in coinage, denotes a kind of puncheon, which in the old way of coining with the hammer, contained the arms, or other figure and infcription to be ftruck on the coin. See COINAGE. Accordingly we ftill call the arms fide of a piece of money the pile, and the head, the crofs; becaufe in antient coin, a crofs ufually took the place of the head in ours: but fome will have it called pile, from the impreffion of a church built on piles, ftruck on this fide our antient coins, and others will have it to come from *pile*, the old french word for a *fhip*.

PILE, in heraldry, an ordinary in form of a wedge, contracting from the chief, and terminating in a point towards the bottom of the fhield. See pl. CXCVII. fig. 6. The pile, like other ordinaries, is borne inverted, ingrailed, &c. and iffues indifferently from any point of the verge of an efcutcheon.

PILES, in medicine, the fame with hæmorrhoids. See HÆMORRHOIDS.

PILGRIMAGE, a kind of religious difcipline, which confifts in taking a journey to fome holy place, in order to adore the relics of fome deceafed faint. Pilgrimages began to be made about the middle ages of the church; but they were moft in vogue after the end of the eleventh century, when every one was for vifiting places of devotion, not excepting kings and princes themfelves; and even bifhops made no difficulty of being abfent from their churches on the fame account. The places moft vifited were Jerufalem, Rome, Compoftella; and Tours; but the greateft numbers now refort to Loretto, in order to vifit the chamber of the bleffed virgin, in which fhe was born, and brought up her fon Jefus, till he was twelve years of age. This chamber, it is pretended, was carried by angels into Dalmatia, about the year 1291, and afterwards in the fame manner tranfported to Loretto, where a magnificent cathedral is built over it. In this chamber, is the image of the bleffed Virgin, almoft covered with pearls and diamonds, and round the ftatue is, a kind of rainbow formed of precious ftones of various colours. Five hundred thoufand pilgrims fometimes

times resort to this house in one year, in order to pay their devotions before this glorious image.

The mahometans are commanded in the Koran, to perform a pilgrimage to Mecca; this is one of the capital points of their religion, and therefore a prodigious cavalcade of pilgrims annually go thither, in the company of those who are sent with the grand seignor's presents, to the tomb of Mahomet.

PILL, in pharmacy, a form of medicine resembling a little ball, to be swallowed whole, invented in favour of such as cannot take bitter and ill tasted medicinal draughts, as also to keep in readiness for occasional use without decaying.

Pills are a form, into which little is reduced, besides cathartics in officinal composition. The quantity of those generally assigned for a dose, will not admit of alteratives, which generally take up more room; for the force of a cathartic commonly lying in a small compass, half a dram, which makes four, five, or six pills, is generally sufficient for a dose, while a dose of most alteratives would amount to fifteen or twenty. But nothing ought to be made up in this form that is soluble by the air, as many salts are, because they will run, and destroy the form; and for the same reason, nothing ought to be thus mixed, that will ferment; upon which account, all volatile salts are to be excluded, because they would make the pills swell to six times the bulk.

Some of the most useful pills of the shops, are, 1. Aromatic pills, thus made: take of succotrine aloes, an ounce and a half, of gum guaiacum, an ounce; the aromatic species and balsam of peru, of each half an ounce: let the aloes and gum guaiacum be powdered separately, then mixed with the rest, and formed into a mass with the syrup of orange peel. 2. The more simple pills of coloquintida, are thus prepared: Take the pith of coloquintida, and scammony, of each two ounces; of oil of cloves, two drams: let the dry species be reduced to powder separately, let the oil be mixed with them, and the whole be formed into a mass with syrup of buckthorn. 3. Ecphractic, or deobstruent pills are thus prepared: take of the aromatic pill, three ounces; rhubarb, extract of gentian, and salt of iron, of each one ounce; of salt of wormwood, half an ounce: beat them with a proper quantity of solutive syrup of roses, into a mass. 4. Gum-pills, thus prepared: take galbanum, opopanax, myrrh, sagapenum, of each an ounce; of asafœtida, half an ounce: make them into a mass with the syrup of saffron. 5. Mercurial pills, prepared thus: take of quick-silver, five drams; of strasburg turpentine, two drams; of the cathartic extract, four scruples; of rhubarb, in powder, one dram: first grind the quick-silver with the turpentine, till it appear no longer, then beat them up with the rest, into a mass. if the turpentine chance to be too thick, it is to be thinned with a little oil of olives. 6. Soap-pills, thus prepared: take of almond-soap, four ounces; of strained opium, half an ounce; of essence of lemons, a dram. Beat the opium, softened with a little wine, along with the rest, till they are perfectly mixed. 7. Storax pills, prepared thus: take of strained storax, two ounces; of saffron, an ounce; of strained opium, five drams: beat them together, till they are perfectly mixed, and make them into pills.

PILLAGE, among builders, is a square pillar, standing behind a column, to bear up arches.

PILLAR, in architecture, a kind of irregular column, round and insulated, but deviating from the proportions of a just column.

Pillars are always either too massive, or too slender for regular architecture; such are the pillars which support gothic vaults, or buildings; and indeed, they are not restrained by any rules, their parts and proportions being arbitrary.

Butting PILLAR, the same with a buttress, See the article BUTTRESS.

Square PILLAR, a massive work, called also a pier or piedroit, serving to support arches, &c.

PILLAR, in the manege, is the center of the ring, or manege-ground, round which a horse turns, whether there be a pillar in it or not. Besides this, there are pillars on the circumference, or sides of the manege-ground, placed at certain distances, by two and two, from whence they are called the two pillars, to distinguish them from that of the center. The use of the pillar in the center, is for regulating the extent of ground, that the manege upon the volts may be performed with method and justness, and that they may work in a square, by rule and measure, upon the four lines of the volts; and also to break unruly high-mettled horses

horſes, without endangering the rider. The two pillars are placed at the diſtance of two or three paces, one from the other, and the horſe is put between thoſe, to teach him to riſe before, and yerk out behind, and put himſelf upon raiſed airs, &c. either by the aids, or chaſtiſements.

PILLORY, was antiently a poſt erected in a croſs road, by the lord of the manor, with his arms upon it, as a mark of his ſeignory, and ſometimes with a collar to fix criminals to. At preſent, it is a wooden machine, made to confine the head and hands, in order to expoſe criminals to public view, and to render them publicly infamous. According to Sir Henry Spelman, it was firſt peculiarly intended for the puniſhment of bakers, who ſhould be found faulty in the weight or fineneſs of their bread. At preſent the perſons thus puniſhed, are foreſtallers, thoſe uſing falſe weights, perſons guilty of perjury, &c.

PILOT, a perſon employed to conduct ſhips over bars and ſands, or through intricate channels, into a road or harbour.

Pilots are no conſtant and ſtanding officers aboard our veſſels, but are called in occaſionally, on coaſts or ſhores unknown to the maſter, and having piloted in the veſſel, they return to the ſhore where they reſide.

Pilots taking upon them to conduct ſhips up the Thames, are to be examined and approved by the maſter and wardens of the trinity-houſe at Deptford, or ſhall be liable to forfeit 10 l. for the firſt offence, and 20 l. for the ſecond, &c. and the like penalty, if they act without licence from the ſaid maſter and wardens; and if by their negligence they loſe a ſhip, they ſhall be forever diſabled. 3 Geo. I. and 5 Geo. II. c. 20.

PILSEN, or BILSEN. See BILSEN.

PILSEN is alſo a city of Bohemia, forty miles ſouth-weſt of Prague.

PILULARIA, in botany, a genus of the cryptogamia-muſci claſs of plants; the male-flowers of which are diſpoſed like a line of duſt under the leaf; the fruit is a globe containing four cells, in which are lodged a great many ſeeds.

PILY, or *Barry* PILY. See BARRY.

PILZOW, a town of little Poland, forty-two miles north-eaſt of Cracow.

PIMENTA, or PIMENTO, JAMAICA-PEPPER, or ALL-SPICE, in botany, a tree of a moderate ſize, called by Sir Hans Sloane, myrtus arborea aromatica, foliis laurinis, latioribus, et ſubrotundis: its flower conſiſts of five petals, and its fruit is a roundiſh berry, containing a pulpy matter about the ſeeds. The fruits are gathered when green, and are expoſed to the ſun for many days on cloths, frequently ſhaking and turning them, till thoroughly dry; they take great care they are not wetted by the morning and evening dews, and when thus dried, are ſent over to us.

Pimenta abounds with a fragrant eſſential oil, which is ſeparated, in great quantity, in diſtillation, and is ſo heavy that it ſinks in water. This ſpice is much uſed in our foods, and ſometimes in medicine: it is, indeed, a very good aromatic, and ſo well imitates the mixed flavour of all the reſt, that it has long been a common practice to make the aqua mirabilis, which was ordered to be diſtilled from all the ſpices, of this ingredient alone; and the taſte of the water thus made, when carefully done, is ſo near the genuine, that a very nice palate can only diſtinguiſh it.

The preſent college diſpenſatory orders a ſimple water to be diſtilled from it, a gallon from half a pound of that ſpice, which is a better carminative, than any of the former waters retained under that name.

PIMPINELLA, in botany, a plant of the pentandria-digynia claſs, the general corolla of which is uniform; and the partial one conſiſts of five inflexo, cordated and almoſt equal petals; there is no pericarpium; the fruit is of an oval oblong figure, narrower towards the apex, convex and ſtriated on one ſide, and plain on the other.

PIMPLE, in ſurgery, a ſmall puſtule, ariſing chiefly on the face. See the article PUSTULE.

PIN, in commerce, a little neceſſary implement made of braſs-wire, uſed chiefly by the women in adjuſting their dreſs.

The perfection of pins conſiſts in the ſtiffneſs of the wire and its whiteneſs, in the heads being well turned, and in the fineneſs of the points. The London pointing and whitening, are in moſt repute, becauſe our pin-makers, in pointing, uſe two ſteel-mills, the firſt of which forms the point, and the latter takes off all irregulatities, and renders it ſmooth, and as it were poliſhed; and in whitening, they uſe block-tin granulated: whereas in other countries they are ſaid to uſe a mixture of tin, lead, and

Fig. 1. PERSICA, the *PEACH*.

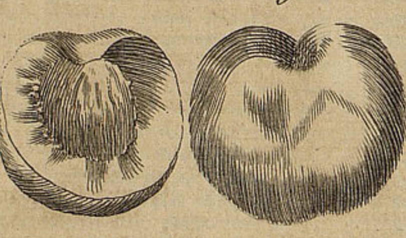


Fig. 3. PEPPER.

Fig. 2. The PINE-TREE.



Fig. 4. PHEONS.

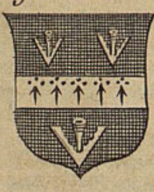


Fig. 7. PLATEA, the *SPOON-BILL*.

Fig. 5. POMEE.



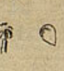
Fig. 6. POINTEE.



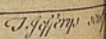
Fig. 8. PHYTOLACCA.











and quick-silver; which not only whitens worse than the former, but is also dangerous, on account of the ill quality of that mixture, which renders a puncture with a pin thus whitened, somewhat difficult to be cured. The consumption of pins, is incredible, and there is no commodity sold cheaper. The number of hands employed in this manufacture is very great, each pin passing through the hands of six different workmen, between the drawing of the brass wire, and the sticking of the pin in the paper.

Pins are sometimes made of iron-wire, rendered black by a varnish of linseed-oil, with lamp-black, which the brass-wire would not receive: these are designed for the use of persons in mourning, though not universally approved of.

Pins on being imported, pay for every twelve thousand, 9 s. $7\frac{1}{2}$ d. and, on exportation, draw back 8 s. $5\frac{1}{4}$ d. they also pay, if made of brass, for every twelve thousand, 2 s. $4\frac{12\frac{1}{2}}{100}$ d. and if made of iron, for every 112 pounds, 4 s. $8\frac{1}{4}$ d. is drawn back on exportation.

PINACIA, πινακια, among the Athenians, tablets of brass, whereon the names of all the persons in each tribe duly qualified, and willing to be judges or senators of the areopagus, being severally written, they were cast into a vessel provided on purpose; and into another vessel were cast the same number of beans, an hundred of which were white, and all the rest black. Then the names of the candidates and the beans were drawn one by one; and those, whose names were drawn out together with the white beans, were received into the senate. See the article AREOPAGUS.

PINCHING, in gardening, a kind of pruning, performed by nipping off the young and tender sprigs of trees and plants, between the nails of the thumb and finger, chiefly practised in April or May, and sometimes in June and July, on the large useless branches, towards the top of a plant or tree, because they consume a great deal of the sap. See the article PRUNING.

PINCHING, in the manege, is when, a horse standing still, the rider holds him fast by the bridle-hand, and applies the spurs just to the hairs of his sides.

Pinching is accounted an aid, spurring a chastisement, or correction.

PINDARIC, in poetry, an ode formed in imitation of the manner of Pindar. The pindaric manner is distinguished by the boldness and height of the flights, the suddenness and surprisingness of the transitions; and the seeming irregularity, wildness, and enthusiasm of the whole. The only part remaining of Pindar's works is a book of odes, all in praise of the victors at the olympian, pythian, nemæan, and isthmian, games; whence the first is intitled the olympians, the second the pythians, the third the nemæans, and the fourth the isthmians. Pindar is full of force and fire; his thoughts are sententious; his stile impetuous; his sallies daring and frequently running, as it were, at random, he affects a beautiful disorder, which yet is said to be the effect of the greatest art. None of our writers seem to have succeeded in the pindaric character better than Cowley.

PINE, *pinus*, in botany, a genus of the monœcia monadelphia class of plants, having no corolla; the male flowers are disposed in clusters, the perianthium consists of four caducous leaves; the female flowers are disposed in globes upon the same plant: there is no pericarpium; the fruit is a large cone, of a turbinated figure, and composed of a very beautiful arrangement of squamæ: the seed is received into a membranaceous ala. See plate CC. fig. 2. The nucleus pini, or kernels of the cones of the pine, are much used in medicine; and they are not only used so; but, in places where they are to be had fresh and in plenty, are eaten at table, and make an ingredient in several good dishes. They are very proper for people inclined to be consumptive, as they are balsamic and restorative: they are also good against heats of urine, and nephritic complaints; they are either to be eaten or made into an emulsion with almonds and barley-water, or with pistachias instead of almonds. At present they are brought to us in abundance from Italy and the south of France.

PINE-APPLE, the same with ananas. See the article ANANAS.

PINEA, or PINE, in commerce, a term used in Peru and Chili, for a kind of light, porous masses, or lumps, formed of a mixture of mercury and silver-dust, from the mines. The ore or mineral of silver being dug out of the veins of the

the mine, is firſt broken, then ground in mills for the purpoſe, driven by water with iron peſtles, each of two hundred pound weight: the mineral thus pulverized is next ſifted; then worked up with water into a paſte, which when half dry, is cut into pieces called cuerpos, a foot long, weighing each about two thouſand five hundred pounds. Each cuerpo is again kneeded up with ſea-ſalt, which diſſolving incorporates with it: they then add mercury, from ten to twenty pounds for each cuerpo, kneeding the paſte afreſh, until the mercury be incorporated therewith. This amalgamation is continued for eight or nine days: when it is done enough, they ſend it to the lavatories, which are large baſons that empty ſucceſſively into one another; the paſte, &c. being laid in the uppermoſt of theſe, the earth is then waſhed from it into the reſt, by a rivulet turned upon it. When the water runs quite clear out of the baſons, they find the mercury and ſilver at bottom incorporated: this matter they call pella, and of this they form the pineas, by expreſſing as much of the mercury as they can, firſt by putting it in woollen bags, and preſſing and beating it thoroughly, then by ſtamping it in a kind of wooden mould, of an octagonal form, at bottom whereof is a braſs plate pierced full of little holes. The matter, being taken out of the mould, is laid on a trivet, under which is a large veſſel full of water, and the whole being covered with an earthen head, a fire is made around it. The mercury ſtill remaining in the maſs, is thus reduced into fumes, and at length condenſing, it is precipitated into the water, leaving behind it a maſs of ſilver grains, of different figures, which only joining or touching at the extremes, render the matter very porous and light. This then is the pinea, or pigne, which the workmen endeavour to ſell privately to the veſſels trading to the ſouth ſeas, and from which thoſe who have ventured to engage in ſo dangerous a commerce, have made ſuch vaſt gains.

PINEAL GLAND, in anatomy, a gland in the third ventricle of the brain, thus called from its reſemblance to a pine-apple. It is of a greyiſh colour, and its proceſſus and baſe are often medullary: this gland has often by many been ſuppoſed the peculiar ſeat of the ſoul. It is otherwiſe called conoides and conarion. See CONOIDES and CONARION.

PINES-ISLAND, a ſmall iſland on the north coaſt of Darien or Terra Firma in America, ſituated in weſt long. 80°, north lat. 9°.

PINGUEDO, in anatomy, the ſame with fat. See the article FAT.

PINGUICULA, BUTTER-WORT, in botany, a genus of the diandria-monogynia claſs of plants, the corolla whereof conſiſts of a ſingle ringent petal; the longer lip is ſtrait, obtuſe, trifid, and ſupine; the ſhorter lip is bifid, more obtuſe, and patent; the nectarium is of a corniculated figure, and is produced from the baſis of the petal: the fruit is an oval capſule, compreſſed at the top, and containing only one cell, in which there are ſeveral ſmall ſeeds, of a cylindric figure, and a looſe receptacle.

PINGUIN, in botany, the name by which Dillenius calls the ananas. See the article ANANAS.

PINHEL, or PINTEL, a town of Portugal, in the province of Tralos montes, ſituated on the river Coa, weſt long. 7° 15′, north lat. 40° 50′.

PINION, in mechanics, an arbor, or ſpindle, in the body whereof are ſeveral notches, which catch the teeth of a wheel that ſerves to turn it round: or it is a leſſer wheel which plays in the teeth of a larger.

In a watch, &c. the notches of a pinion which are commonly 4, 5, 6, 8, &c. are called leaves, and not teeth, as in other wheels. For the pinions of a watch, and the leaves, turns, &c. thereof, ſee the article CLOCK.

Flying PINION. See FLYING *pinion*.

PINK, a veſſel uſed at ſea, maſted and rigged like other ſhips, only that this is built with a round ſtern; the bends and ribs compaſſing ſo as that h ribs bulge out very much. This diſpoſition renders the pinks difficult to be boarded, and alſo enables them to carry greater burdens than others, whence they are often uſed for ſtore ſhips, and hoſpital-ſhips, in the fleet.

PINK, *caryophyllus*, in botany, the engliſh name of ſeveral beautiful ſpecies of the dianthus. See DIANTHUS.

PINNA, a FIN; in natural hiſtory. See the article FIN.

PINNA, in anatomy. The lateral and inferior part of the noſe is called pinna naſi; and the ſuperior and broad part of the

the external ear is denominated pinna auris. See the articles Ear and Nose.

PINNÆ MARINÆ, in the hiſtory of the ſhell-fiſh, a name given to ſeveral of the larger muſcles. See the article Muscle.

PINNACE, a ſmall veſſel uſed at ſea, with a ſquare ſtern, having ſails and oars, and carrying three maſts, chiefly uſed as a ſcout for intelligence, and for landing of men, &c. One of the boats belonging to a great man of war, ſerving to carry the officers to, and from, the ſhore, is alſo called the pinnace. See the article Ship.

PINNACLE, in architecture, the top or roof of an houſe, terminating in a point. This kind of roof, among the antients, was appropriated to temples; their ordinary roofs were all flat, or made in the platform way. It was from the pinnacle that the form of the pediment took its riſe.

PINNATED LEAVES, *pinnata folia*, in botany, leaves formed in manner of a wing, and compoſed of two large ranges, or ſeries of foliola, annexed to the two ſides of one common, oblong petal. Of the pinnated leaves, however, there are ſeveral kinds. 1. The pinnated with an odd one: (plate CXCVII. fig. 3. n° 1.) this expreſſes the pinnated leaf, when beſide the two ſeries juſt mentioned, there is an odd leaf at the extremity of the petiole. 2. The pinnated without an odd leaf. *ibid.* n° 2. 3. The pinnated abrupt leaf, *ibid.* n° 3: this expreſſes a pinnated leaf, in which there is neither an odd leaf, nor a tendril at the end of the petiole. 4. The oppoſitely pinnated, which is when the folioles ſtand oppoſite to one another, on the common petiole, as in n° 2. 5. The alternately pinnated, when the folioles ſtand not oppoſite, but alternately, as in n° 1, 3. and 6. The interruptedly pinnated, in which the folioles are irregular and unequal in ſize and ſituation, *ibid.* n° 4. 7. The cirrhatedly pinnated, wherein the extremity of the petiole has one or more tendrils, inſtead of an odd leaf, *ibid.* n° 5. 8. The decurrently pinnated, in which the folioles extend beyond their proper baſe, in going down the petiole, and as it were, make it alated, *ibid.* n° 6. 8. The membranaceous pinnated, of the ſame form with the laſt, but with the petioles themſelves membranaceous and articulated, ibid. n° 7. 9. The conjugated pinnated leaf, when the whole compound leaf conſiſts only of two folioles, on the petiole, ibid. n° 8: this kind of pinnated leaf may be either abrupt cirrhated, membranaceous in the petiole, or ſtipulated. 10. Duplicato-pinnatum, or pinnato-pinnatum, expreſſes a leaf compoſed of ſeveral others, each of which is itſelf compoſed of ſeveral ſmaller leaves, or foliola, ibid. n° 9. 11. Triplicato-pinnatum expreſſes a leaf, the petioles of which ſend out three alated ſubdiviſions, before it has any leaves on it, ibid. n° 10. Theſe laſt are terminated ſometimes by two foliola each, and in that caſe, are ſaid to be abrupt; ſometimes by an odd leaf, and are then called triplicato-pinnata cum impari.

PINNATUS, in heraldry, a term uſed by the latin writers upon that ſubject, to expreſs that ſort of line in arms, which is called, by our writers, the embattled line, or crenelle.

PINNEBURG, a town of Germany, in the circle of lower Saxony, and the dutchy of Holſtein, ſituated ten miles north of Hamburgh.

PINNING, in building the faſtening of tiles together, with pins of heart of oak, for the covering of an houſe, &c.

PINT, a veſſel, or meaſure uſed in eſtimating the quantity of liquids, and even ſometimes of dry things. See the article Measure.

PINTADO, in ornithology, the ſame with the meleagris, or turkey. See the article Turkey.

PINTLE, among gunners, an iron, which ſerves to keep the gun from recoiling.

Pintles, in a ſhip, are hooks by which the rudder hangs to the ſtern-poſt.

PINUS, in botany. See the article Pine.

PIOMBIONO, a city and port town of Italy, in the dutchy of Tuſcany, ſituated on a bay of the Tuſcan-ſea, thirty miles ſouth of Leghorn.

PIONEER, in the art of war, a labourer employed in an army to ſmooth the roads, paſs the artillery along, and dig lines and trenches, mines, and other works.

PIONY, in botany. See Pæonia.

PIP, or Pep, *Pepia*, a diſeaſe among poultry, conſiſting of a white thin ſkin, or film, that grows under the tip of the tongue, and hinders their feeding. It uſually ariſes from want of water, or from the drinking puddle-water, or eating filthy meat. It is cured by pulling off the film with the fingers, and rubbing the

the tongue with salt. Hawks are particularly liable to this disease, especially from feeding on stinking flesh.

PIPE, in building, &c. a canal, or conduit, for the conveyance of water and other liquids. Pipes for water, water-engines, &c. are usually of lead, iron, earth, or wood: the latter are usually made of oak or elder. Those of iron are cast in forges, their usual length is about two feet and a half; several of these are commonly fastened together by means of four screws at each end, with leather or old hat between them, to stop the water. Those of earth are made by the potters; these are fitted into one another, one end being always made wider than the other. To join them the closer, and prevent their breaking, they are covered with tow and pitch: their length is usually about that of the iron-pipes. The wooden pipes are trees bored with large iron augres, of different sizes, beginning with a less, and then proceeding with a larger successively; the first being pointed, the rest being formed like spoons, increasing in diameter, from one to six inches or more: they are fitted into the extremities of each other, as represented in plate CCI. fig. 1. and are sold by the foot.

Wooden pipes are bored as follows. The machine represented *ibid.* fig. 2. is put in motion by the wheel A, which is moved by a current of water; upon the axle of this wheel, is a cog-wheel, B, which causes the lanterns C, D, to turn horizontally, whose common axis is consequently in a perpendicular direction. The lantern D, turns at the same time, two cog-wheels, E, and F; the first E, which is vertical, turns the augre which bores the wood, and the second F, which is horizontal, causes the carriage bearing the piece to advance by means of the arms, H, I, which takes hold of the notches in the wheel, K. The first, H, by means of the notches, draws the wheel towards F, and the other, I, pushes the under-post of the wheel, in an opposite direction; both which motions tend to draw the carriage towards F, and consequently cause the augre to pierce the wood. The augre being from nine to twelve feet in length, and of a proportionable bigness, it will be necessary to have two pieces, as L, L, to support its weight, and cause it to enter the piece to be bored with the same uniformity.

Leaden pipes are of two sorts, the one soldered, the other not soldered: for the construction of each sort, see the article PLUMBERY.

It appears from what has been said under the article FLUID, that we cannot only conduct water into pipes to very great distances, but bring it from one mountain to another, in pipes that go down into the interjacent vallies, and come up again, provided the reservoir into which we bring the water, be something lower than the spring from whence it comes, and whence the pipes begin: but it is necessary that we should here take notice of some impediments that often arise in practice, and show how to prevent or remedy them: the chief of these impediments arises from air in the pipes, by which the water is said to be wind-bound; by these means, a pipe of two or three inches bore, will sometimes not give more water than if it was but of one inch bore. The air may be discharged, and the pipe relieved, thus: Let A, B, C, D, *ibid.* fig. 3. be the spring from which a pipe is to bring water to the delivery at E, which suppose a mile from the spring. Now we will suppose E, to be a little lower than D; for example, four or five feet. If the surface of the water in the spring, comes down to the mouth of the pipe at D, or sometimes near it, there will be a good deal of air that will run down with the water into the pipe; and wherever the ground rises in the conduit of the pipe, this air will lodge itself in the upper parts of the pipe, as *a o m r*, and thereby diminish the water-way of the pipe, so as to force the water to pass between *o* and *n*, a passage perhaps ten times less than the pipe when free. The way to clear the pipe of this air, is by going from D, along the pipe; when you come to the first rising ground, drive a nail at the highest part of the pipe, as at *m*, so as to make a hole through it: then taking out the nail, the air will blow out violently, till at last the water succeeds the air: then let the hole be quite stopped up; and doing this at every eminence of the pipe, the whole air will be discharged, and the full quantity of water will be brought home at E. If the spring be very much higher than the place of delivery, the places of air in the pipe will not be just at the highest part of the pipe, but a little beyond it; because the water running with greater velocity and force, drives the lodged air forward, as may

may be ſeen at *o p g*, which other ways would have been at *s*; and therefore the hole muſt be made beyond *s*. If the end E, be ſtopped for ſome time, ſo that the water may ceaſe to be in motion, the air will go back gradually, as appears at *u y w t*, where it may be let out.

But Dr. Deſaguliers propoſes to clear the pipes of air, by means of a ſmall pipe, which he calls a rider, laid over the eminent part of the main of a pipe, as *d e f*, *ibid.* fig. 4. communicating with the main at the top of the eminence, as at *e*, with a little branch and cock C, which being opened when the engine is working, the air, being puſhed forward, is catched at *d*, and diſcharged by the cock. The Dr. contrived an invention which he calls a Jack in the box, whereby air-cocks would open and ſhut of themſelves, by the running of water, and motion of the air only. This contrivance is deſcribed in the philoſophical tranſactions, n° 393.

The ſeveral impediments, water in conduit-pipes, meets with from friction, preſſure, &c. and the methods of remedying them, have already been taken notice of under the articles FLUID and FOUNTAIN.

PIPES *of an organ*. See the article ORGAN.

Bag-PIPE. See the article BAGPIPE.

Tobacco-PIPE, a machine uſed in the ſmoaking of tobacco, conſiſting of a long tube, made of earth or clay, having at one end a little caſe, or furnace, called the bowl, for the reception of the tobacco, the fumes whereof are drawn by the mouth through the other end. Tobacco-pipes are made of various faſhions; long, ſhort, plain, worked, white, varniſhed, unvarniſhed, and of various colours, &c. The Turks uſe pipes three or four feet long, made of ruſhes, or of wood bored, at the end whereof they fix a kind of a pot of baked earth, which ſerves as a bowl, and which they take off after ſmoaking.

PIPE alſo denotes a veſſel or meaſure for wine, and things meaſured by wine-meaſure. See the article MEASURE.

PIPE, in mining, is where the ore runs forwards end-ways in a hole, and doth not ſink downwards, or in a vein.

PIPE, *pipa*, in law, is a roll in the exchequer, called alſo the great roll. See the next article.

PIPE-OFFICE is an office wherein a perſon called the clerk of the pipe, makes out leaſes of crown-lands, by warrant from the lord-treaſurer, or commiſſioners of the treaſury, or chancellor of the exchequer. The clerk of the pipe makes out alſo all accounts of the ſheriffs, &c. and gives the accomptants their quietus eſt. To this office are brought all accounts which paſs the remembrancer's office, and remain there, that if any ſtated debt be due from any perſon, the ſame may be drawn down into the great roll of the pipe; upon which the comptroller iſſues out a writ, called the ſummons of the pipe, for recovery thereof; and if there be no goods or chattels, the clerk then draws down the debts to the lord treaſurer's remembrancer, to write eſtreats againſt their lands. All tallies which vouch the payment of any ſum contained in ſuch accounts, are examined and allowed by the chief ſecondary of the pipe. Beſides the chief clerk in this office, there are eight attornies, or ſworn clerks, and a comptroller.

PIPER, PEPPER, in botany. See PEPPER.

PIPER, in ichthyology, a ſpecies of trigla, with a bifid roſtrum, and tubuloſe noſtrils. See the article TRIGLA.

The head of this ſpecies is very large in proportion to the body; the mouth is remarkably wide; the eyes are large, and ſtand at a very ſmall diſtance from each other at the top of the head, and are covered with a ſkin; the bony covering of the head is angulated, and terminates in two horns at the hinder part; the roſtrum is formed into ſpines, and at the upper part of the orbits of the eyes there is alſo a robuſt and crooked ſpine; the body is ſomewhat rounded, and of a conic figure, very large towards the head, and extremely ſmall at the tail; over each of the pectoral fins there ſtands a very robuſt and ſharp thorn, and there are on each ſide three articulated appendages: this fiſh grows to more than a foot in length: and, when caught, it makes a ſingular and loud noiſe.

PIPERNO, a town of Italy, in the territory of the pope, and Campania of Rome, ſituated fifty miles ſouth-eaſt of Rome, in the way to Naples.

PIPLEY, a port town of India in Aſia, ſituated on the weſt ſide of the bay of Bengal, in eaſt longit. 86°, and north lat. 21°.

PIQUETE. See PICKET and PICQUET.

PIQUETTE, among floriſts, a term uſed for a certain ſort of carnations, which have always a white ground, and are ſpotted, or,

or, as they call it, pounced with ſcarlet, red, purple, and other colours.

PIQUIGNI, a town in France, of the province of Picardy, ſituated on the river Somme, ſeven miles eaſt of Amiens.

PIRANO, a port town of Iſtria, in the territory of Venice, ſituated on a bay in the gulph of Venice, ten miles ſouth of Cabo d'Iſtria.

PIRATE, PYRATE, or ROVER, *pirata*, a perſon, or veſſel, that robs on the high ſeas, without permiſſion or authority of any prince or ſtate.

When a pirate enters into any port or haven, and there robs a merchant's ſhip, this is not held to be piracy, becauſe it is not done on the high ſea, but it is a robbery at the common law. In caſe a ſhip is riding at anchor on the ſea, and it happens that the mariners or ſeamen are part in their boat, and the reſt on ſhore, by which accident none are left in the ſhip; here, if a pirate ſhall attack her, and commit a robbery, the ſame is piracy. Nevertheleſs, the taking, by a ſhip at ſea, in great neceſſity of victuals, cables, ropes, &c. ſuch things out of another veſſel, is not ſo, where that other veſſel can ſpare ſuch things, and the takers pay or give ſecurity for them. The manner of trying a pirate, is by a ſpecial commiſſion, directed to the lord high admiral, &c. and the offence of piracy may be heard and determined, as if the robbery was committed on land; and offenders ſhall ſuffer the like pains of death, loſs of lands and goods, &c. Perſons combining to yield up ſhips to pirates, or to lay violent hands on the commanders of ſhips, or that correſpond with any pirate, are adjudged guilty of piracy. All the proper goods of pirates are granted to the lord high admiral by patent; but not their piratical goods, which, where the owner is not known, belong to the king.

PIRITZ, a town of Germany, in the circle of Upper Saxony, and the dutchy of Pomerania, ſituated fifteen miles ſouth of Stetin.

PIROUETTE, or PYROET, in the manege, a turn or circumvolution, which a horſe makes without changing his ground. Pirouettes are either of one tread or piſte, or of two. The firſt is an entire ſhort turn which the horſe makes upon one tread, and almoſt in one time, in ſuch manner as that his head comes to the place where his tail was, without putting out his haunches. In the pirouette of two treads or piſtes, he takes a ſmall compaſs of ground, almoſt his length, and marks both with the fore-part and the hind.

PISA, a city of Italy, in the dutchy of Tuſcany, ſituated on the river Arno, four miles eaſt of the ſea, and ten miles north of Leghorn.

PISCA, a port-town of Peru, in ſouth America, ſituated in the province of Lima: weſt long. 76°, ſouth lat. 14°.

PISCARY, *piſcaria*, in our antient ſtatutes, the liberty of fiſhing in another man's waters.

PISCATAWAY, a harbour of New Hampſhire, in America, ſituated in weſt long. 70°, and north lat. 43° 35′.

PISCES, in aſtronomy, the twelfth ſign or conſtellation of the zodiac. The ſtars in piſces, in Ptolemy's catalogue, are 38; in Tycho's, 33; and in the Britannic, catalogue 109.

PISCINA, in antiquity, a large baſon in a public place or ſquare, where the roman youth learned to ſwim, and which was ſurrounded with a high wall, to prevent caſting of filth into it.

It alſo ſignifies a lavatory among the Turks, placed in the middle court of a moſque or temple, where the muſſulmans waſh themſelves before they offer their prayers. See ABLUTION.

PISCIS AUSTRALIS, in aſtronomy. See the article AUSTRAL.

PISCIS VOLANS, in aſtronomy, a ſmall conſtellation of the ſouthern hemiſphere unknown to the antients, and inviſible to us in theſe northern regions.

PISONIA, in botany, a genus of the dioecia-pentandria claſs of plants, the corolla whereof is of an infundibuliform ſhape; the tube is ſhort; the limb is ſemiquinquifid acute and patulous; the fruit is an oval quinquangular capſule, formed of five valves, and containing only one cell; the ſeed is ſingle, ſmooth, and ovato oblong.

PISSASPHALTUM, EARTH-PITCH, in natural hiſtory, a fluid, opake, mineral body, of a thick conſiſtence, of a ſtrong ſmell, readily inflammable, but leaving a reſiduum of greyiſh aſhes after burning. It ariſes out of the cracks of rocks, in ſeveral places in the iſland of Sumatra, and in ſome other parts of the Eaſt Indies, and is much eſteemed there, in paralytic diſorders. It is greatly recommended by the antients as an emollient, maturant, and digeſtive, and was uſed in cataplaſms for ripening all ſorts of tumours,

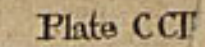


Fig. 1. PISTONS.

No. 3. No. 2. No. 1. No. 4. No. 5. No. 6. No. 7.

Fig. 2. PLASTERS.

T. Jefferys sculp

mours, and againſt the ſciatica, and other pains of the limbs.

PISSELÆUM INDICUM, BARBADOES-TAR, in natural hiſtory, a mineral fluid, of the nature of the thicker bitumens, and of all others the moſt approaching, in appearance, colour, and conſiſtence, to the true piſſaſphaltum, tho' differing from it in other reſpects. It is very frequent in many parts of America, where it is found trickling down the ſides of mountains in large quantities, and ſometimes floating on the ſurface of the waters: but it ſeems to be almoſt loſt at this time in the iſland of Barbadoes, from whence it was originally named. It has been greatly recommended internally in coughs and other diſorders of the breaſt and lungs; but it is ſeldom to be met with genuine.

PISTACIA, in botany, a genus of the dioecia-pentandria claſs of plants, having no corolla; the fruit is a dry roundiſh drupe, and the ſeed is an oval ſmooth nut. This genus comprehends the maſtich-tree, the turpentine-tree, and the piſtachia-nut-tree.

Piſtachia-nuts abound with a ſweet and well-taſted oil, which they will yield in great abundance, on being preſſed after bruiſing them: they are reckoned wholeſome and nutritive, and are very proper to be preſcribed by way of reſtoratives, eaten in a moderate quantity, and to people emaciated with long illneſſes. They are recommended as peculiarly good to prevent obſtructions of the liver.

PISTE, in the manege, the tread or track a horſe makes upon the ground he goes over. The piſte of a horſe may be either ſingle or double: if the rider makes him go but an ordinary gallop in a circle, or rather ſquare, he will make but a ſingle piſte; if he makes him gallop with his haunches in, he will make two piſtes, one with the fore part, another with the hind. And the ſame, if the rider makes him paſſage, or go ſide-ways, either in a ſtraight line, or upon a circle.

PISTIA, in botany, a genus of the gynandria-hexandria claſs of plants, the corolla whereof conſiſts of a ſingle, unequal, cucullated, turbinated petal: the fruit is a roundiſh capſule, attenuated at the baſe, containing ſix cells, and a few truncated ſeeds.

PISTIL, among botaniſts, denotes the female organ of generation in plants; it conſiſts of three parts, the germen, ſtyle, and ſtigma; the germen ſupplies the place of an uterus in plants, and is of various ſhapes, but always ſituated at the bottom of the piſtil, and contains the embryo-ſeeds: the ſtyle is a part of various forms alſo, but always placed on the germen: and the ſtigma is alſo of various figures, but always placed on the top of the ſtyle, or, if that be wanting, on the top of the germen.

PISTOJA, a town of Tuſcany, twenty miles north-weſt of Florence.

PISTOL, the ſmalleſt piece of fire-arms, borne at the ſaddle-bow, on the girdle, and in the pocket.

PISTOLE, a gold-coin, ſtruck in Spain, and in ſeveral parts of Italy, Switzerland, *&c.* See the article COIN.

The piſtole has its augmentations and diminutions, which are quadruple piſtoles, double piſtoles, and half-piſtoles.

PISTON, *embolus*, in pump-work, is a ſhort cylinder of metal, or other ſolid ſubſtance, fitted exactly to the cavity of the barrel or body of the pump.

Here follows an account of Mr. Belidor's piſtons or buckets, which are either lifting or ſucking. The lifting piſton conſiſts of a ſhort hollow cylinder CDIK (plate CCII. fig. 1. n° 1, 2, 3, 4.) which has at bottom two ears, or handles, cut from the cylinder, as EI, FK, with a hole through each, which is to receive a ſtrong pin ML (n° 2.) to join it to its lifting rod PNO. This cylinder has a broad ſhoulder EF, ſtanding out to ſtop ſeveral rings of leather, which are ſlipped upon the cylinder, as you may ſee at GH (n° 2, 3.) There is at the upper end a male ſcrew CD, to receive the female one AB. Upon the face or flat of this ſcrew is faſtened, with ſmall ſcrews, and a leather between, the valve Q; the deſcription of which will be given under the article VALVE.

In the ſucking piſtons (*ibid.* n° 5, 6, 7.) the valves are not ſcrewed to the pieces that hold and ſqueeze the leathers FG (by AB in the former piſtons); but are faſtened between the handles C, D, by means of ſmall ſcrews, upon a return of the cylinder. Q (n° 5.) ſhews the valve upright upon its bed; HL, the hollow of the cylinder; and IK, the leathers. The handle here is at top, with its rod and center-pin. N° 6. *ibid.* repreſents the piſton with only one of its handles at C; the other being taken off, the better to ſhew the valve upright and in front at Q. AB is the return of the cylinder on which

which the bed of the valve is fcrewed; and HL, the place of the leathern rings. N° 7. *ib.* fhews the pifton viewed downwards, from the center-pin that goes through the handles OP, OP, but the rod is off; MM, NN, are the places where the bed of the rod is fcrewed, and Q is the valve fhut.

Thefe piftons require to be very exactly turned in a lathe, and the barrels in which they work to be nicely bored, otherwife they will not be tight. However, if a thin leather be folded upwards at AB (n° 5.) and another folded downwards at FG, they will do pretty well, notwithftanding fome irregularities: fuch leathers may be feen in our defcription of the forcing-pump. See the articles FORCER and PUMP.

PISUM, the PEA, in botany, a genus of the diadelphia-decandria clafs of plants, with a tetrapetalous papilionaceous flower; its fruit is a large, unilocular, and bivalve pod, containing feveral globofe feeds.

Peas are nutritive, and accordingly ufed for food, but rarely for any medicinal purpofes, except to keep iffues open; for which purpofe they are rubbed with bafilicon, or linimentum Arcæi.

There is alfo a medicinal compofition called pifa, from its being made up in the form of peas. The yellow kind, pifa lutea, is made of yellow ochre, half an ounce; florentine orrice-root, two drams; yellow bees-wax, one ounce; and venice turpentine, as much as is fufficient to make them into peas: thefe are intended to promote the running of iffues, as they draw more than common white peas. There is alfo a red kind, made of vermilion, half an ounce; hermodactyls, two drams; yellow bees-wax, fix drams; which are to be formed into peas with turpentine.

PIT *of a theatre*, all that fpace between the amphitheatre or galleries, and theatre or ftage, called by the antients orcheftra. See the article ORCHESTRA.

Brine-PITS, the name given by the people of Worcefterfhire and Chefhire to the wells or pits affording falt-water, out of which they extract the falt. See SALT.

PITCH, a tenacious oily fubftance, drawn chiefly from pines and firs, and ufed in fhipping, medicine, and various other arts: or it is more properly tar, infpiffated by boiling it over a flow fire.

The method of procuring the tar, is by cleaving the trees into fmall billets, which are laid in a furnace that has two apertures, through one of which the fire is put, and through the other the pitch is gathered, which, ouzing from the wood, runs along the bottom of the furnace into places made to receive it. When the fmoke, which is here very thick, gives it its blacknefs; this is called tar, which, on being boiled, to confume more of its moifture, becomes pitch. See TAR.

There is another method of drawing pitch, ufed in the Levant: a pit is dug in the ground, two ells in diameter at the top, but contracting as it grows deeper; this is filled with branches of pine, cloven into fhivers; the wood at the top of the pit is then fet on fire, and burning downwards, the tar runs from it, out of a hole made in the bottom; and this is boiled, as above, to give it the confiftence of pitch.

Pitch acquires different names, according to its different preparations, colours, and qualities: as it diftils from the wood, it is called barras; but afterwards it affumes a double name, the fineft and cleareft being called galipot, and the coarfer marbled barras. Of the galipot is made what is called white pitch, or burgundy pitch, which is nothing but the galipot melted with oil of turpentine; though fome will have it a native pitch, diftilling from a refinous tree growing in the mountains of Franche Comte.

Pitch from the britifh plantations pays on being imported, a duty of 9s. $7\frac{1}{4}$d. for every laft, containing twelve barrels, and draws back on exportation 8s. $5\frac{1}{4}$d. For every twelve barrels not from the britifh plantations, on importation, 10s. $9\frac{56\frac{1}{4}}{100}$d. and draws back, on exportation, 9s. $7\frac{31\frac{1}{4}}{100}$d.

PITH, in vegetation, the foft fpungy fubftance contained in the central parts of plants and trees. As the fubftance of the trunk in trees, fays Boerhaave, becomes more woody, the pith is compreffed, and ftraitened to fuch a degree, that it wholly difappears. It is plain from this, that the office of the pith in vegetation, cannot be very great, fince it is not of perpetual duration. By its fpungy ftructure, it feems fitted to receive any fuperfluous moifture, that might tranfude through the pores of the woody fibres. If, by the excefs of fuch moifture, or from any other caufe, it happens to rot and perifh, as frequently happens in elms, the

the tree is found to grow full as well without it; a proof it is of no eſſential uſe in vegetation.

PITHA, a port-town of Sweden, capital of the province of Pitha-Lapmark, ſituated on the weſt ſide of the Bothnic gulph: eaſt long. 20°, north lat. 64° 45′.

PITTANCE, *pietantia*, a word chiefly uſed among religious, and thoſe who live in a community, ſignifying the commons, or allowance of meat, be it fiſh, fleſh, or the like, ſtatedly eaten at meals, beſides bread.

PITTENWEEM, a port-town of Scotland, in the county of Fife, at the entrance of the Firth of Forth, twenty-three miles north-eaſt of Edinburgh.

PITUITA. See PHLEGM and SALIVA.

PITUITARY GLAND, in anatomy, a gland in the brain, of the ſize of a very large pea, placed under the cella of the os ſphenoides, under the infundibulum, wherewith it communicates, receiving from it a lymph or a juice, which the infundibulum derives from the plexus choroides and pineal gland; and from this lympha does the gland itſelf take its name. It alſo filtrates a juice itſelf, ſeparating from the blood a white liquor, very ſubtile, and apparently very ſpirituous.

PIVAT, or PIVOT, a foot or ſhoe of iron, or other metal, uſually conical, or terminating in a point, whereby a body, intended to turn round, bears on another fixed at reſt, and performs its circumvolutions. The pivot uſually bears or turns round in a ſole, or piece of iron or braſs, hollowed to receive it.

PLACAGNOSCIERIA, in natural hiſtory, the name of a genus of ſpars. See the article SPAR.

The bodies of this genus are dull and opake, cryſtalline, terrene ſpars, formed into cruſts, and of an irregular and not ſtriated texture within. Of this genus there are three known ſpecies. 1. A hard, whitiſh-brown one, found very frequently on the roofs and ſides of caverns on Mendip-hills, and in other parts of England. 2. A dull, crumbly, whitiſh one, found in many parts of England, encruſting the ſides of caverns, and of fiſſures of ſtone. And, 3. A dull, pale-brown one, of a very coarſe texture. This is the moſt common of all the bodies of this genus, and is found in variety of forms; among others, encruſting the ſides and bottoms of our tea-kettles, and other veſſels, in which water is frequently boiled.

PLACARD, or PLACART, among foreigners, ſignifies a leaf or ſheet of paper, ſtretched out, and applied on a wall or poſt, containing edicts, regulations, &c. Among us, placard ſignifies a licence, whereby a perſon is permitted to uſe unlawful games, &c.

PLACARD, in architecture, denotes the decoration of the door of an apartment, conſiſting of a chambranle, crowned with its frieze or gorge, and a corniche, ſometimes ſupported by conſoles. See the article DOOR.

PLACE, *locus*, in philoſophy, a mode of ſpace, or that part of immoveable ſpace which any body poſſeſſes. See SPACE.

Place is to ſpace or expanſion, ſays Mr. Locke, as time is to duration. Our idea of place is nothing but the relative poſition of any thing with reference to its diſtance from ſome fixed and certain points. Whence we ſay, that a thing has or has not changed place, when its diſtance either is or is not altered with reſpect to thoſe bodies with which we have occaſion to compare it. That this is ſo, continues that great philoſopher, we may eaſily gather from hence, that we have no idea of the place of the univerſe, though we can of all its parts. To ſay that the world is ſomewhere, means no more than that it does exiſt: however, the word place is ſometimes taken to ſignify that ſpace which any body takes up; and in this ſenſe, according to the ſame author, the univerſe may be conceived in a place; but he thinks that this portion of infinite ſpace poſſeſſed by the material world, might more properly be called extenſion.

Ariſtotle, and his followers, conceive place to be the immoveable and contiguous concave ſurface of an ambient body; ſo that, as Mr. Boyle obſerves, it is a kind of veſſel, which every way contains the body lodged in it; only with this difference, that a veſſel is a kind of moveable place: hence it has been uſually affirmed, that what is in no place, is not at all: yet it appears not, ſays the laſt mentioned author, how the outermoſt heaven can be called a place, ſince theſe philoſophers aſſerting the world to be finite, muſt grant there is no ambient body without it to contain it; and if the outermoſt heaven ſhould be impelled by the power of God in a ſtraight line, this or that way, there would enſue a motion without a change of place; for the outermoſt heaven which

was in none before, and does not by its progreſſion come to be contained by a new ambient body, and, in this caſe, even according to the favourers of Ariſtotle, who approve Des Cartes' definition of local motion, the world may be ſaid to move without changing place; for it does not paſs from the neighbourhood of ſome bodies to that of others; ſince compriſing all bodies, and yet being bounded, there is no body for it to leave behind, nor any beyond for it to approach. See the article MOTION.

Ariſtotle divides ſpace into external and internal; the firſt being that already conſidered, includes or contains the body; and the other, that ſpace or room which the body contains. But Sir Iſaac Newton better and more intelligibly diſtinguiſhes place into abſolute and relative; abſolute or primary place being that part of infinite and immoveable ſpace which a body poſſeſſes; and relative or ſecondary place being the ſpace it poſſeſſes, conſidered with regard to the other adjacent bodies.

Optical PLACE, the point to which the eye refers an object.

The optical place of a ſtar is a point of the ſurface of the mundane ſphere, wherein a ſpectator ſees the center of a ſtar. See the article PARALLAX.

PLACE *of radiation*, is the ſpace in a medium or tranſparent body through which any viſible object radiates.

The place of the ſun, ſtar, *&c.* alſo denotes the ſign and degree of the zodiac which the luminary is in; or the degree of the ecliptic, reckoning from the beginning of aries, which the planet or ſtar's circle of longitude cuts; and therefore coincides with the longitude of the ſun, planet, or ſtar. As the ſine of the ſun's greateſt declination 23° 30′: to the ſine of any preſent declination given or obſerved, for inſtance, 23° 15′ : : ſo is the radius 10 : to the ſine of his longitude 81° 52′; which, if the declination were north, would give 20° 52′ of gemini; if ſouth 20° 52′ of capricorn for the ſun's place. See DECLINATION, *&c.*

The place of the moon being that part of her orbit wherein ſhe is found at any time, is of various kinds, by reaſon of the great inequalities of the lunar motions, which render a number of equations and reductions neceſſary before the juſt point be found. The moon's fictitious place is her place once equated; her place nearly true, is her place twice equated; and her true place is her place thrice equated. See the article MOON.

Excentric PLACE *of a planet.* See the article EXCENTRIC.

Geocentric PLACE *of a planet.* See the article GEOCENTRIC.

Heliocentric PLACE *of a planet.* See the article HELIOCENTRIC.

PLACE, in geometry. See LOCUS.

PLACE, in war, a general name for all kinds of fortreſſes where a party may defend themſelves: thus, 1. A ſtrong or fortified place, is one flanked, and covered with baſtions. 2. A regular place, one whoſe angles, ſides, baſtions, and other parts, are equal; and this is uſually denominated from the number of its angles, as a pentagon, hexagon, *&c.* 3. Irregular place, is one whoſe ſides and angles are unequal. 4. Place of arms, is a ſtrong city or town pitched upon for the chief magazine of an army; or, in a city or garriſon, it is a large open ſpot of ground, uſually near the center of the place where the grand guard is commonly kept, and the garriſon holds its rendezvous at reviews; and in caſes of alarm to receive orders from the governor. 5. Place of arms of an attack, in a ſiege, is a ſpacious place covered from the enemy by a parapet or epaulement, where the ſoldiers are poſted ready to ſuſtain thoſe at work in the trenches againſt the ſoldiers of the garriſon. 6. Place of arms particular, in a garriſon, a place near every baſtion where the ſoldiers ſent from the grand place to the quarters aſſigned them, relieve thoſe that are either upon the guard or in fight. 7. Place of arms without, is a place allowed to the covert-way for the planting of cannon, to oblige thoſe who advance in their approaches to retire. 8. Place of arms in a camp, a large place at the head of the camp for the army to be ranged in and drawn up in battalia. There is alſo a place for each particular body, troop, or company, to aſſemble in. See the articles CAMP, TROOP, *&c.*

PLACE, in logic and oratory, denotes the ſeat or ſource of an argument, of which there are two kinds, inartificial and artificial; the firſt is the place of teſtimony, authority, *&c.* the ſecond, that of reaſon, as when we argue from univerſals, cauſes, *&c.*

Common PLACE. See COMMON PLACE.

PLACENTA, in anatomy, a ſoft roundiſh maſs found in the womb of pregnant women;

women; which from its refemblance to the liver, was called by the antients hepar uterinum, the uterine liver.

The number of placentæ in human fubjects, anfwers to that of the fœtufes; and as thefe are ufually fingle, the placenta is ufually fo too: but when there are two or more fœtufes, there are always as many placentæ; yet in this cafe they often cohere together fo as to feem but one; but even in this cafe, their veffels do not communicate from one to the other.

The placenta is about eight or nine inches in diameter, and about an inch in thicknefs. Its convex and fpongy part is connected to the uterus, by means of a very thin and fine membrane, which is reticulated, villofe, and continuous with the chorion. Its concave part is turned towards the fœtus, and fhews a multitude of very large veffels: it is joined to the navel-ftring, and furrounded with a fmooth membrane from the chorion and amnios. It has no certain part of the uterus to adhere to; but is ufually fixed to its bottom. Its fubftance, according to Ruyfch and Heifter, is truly vafcular, or compofed folely and entirely of the umbilical veins and arteries, interwoven in a very curious manner.

The placenta has generally been looked upon as an original part among the fecundines; but according to Dr. Thomas Simfon of St. Andrews, it feems to have no place in the ovarium, nor in the uterus, till once the ovum becomes contiguous to the fundus, and then every contiguous part becomes really a placenta. He thinks the fundus uteri a place peculiarly fitted for the growth of the placenta, as proper foils encourage the growth of the roots of trees and fhrubs, many of which are propagated by the branches however placed: fo that every part of them feems equally fitted to be root or branch. Hence he thinks extra-uterine conceptions can have no placenta; and he fays, there are no inftances in authors to contradict his opinion. The placenta, according to Dr. Monro of Edinburgh, does not increafe in the fame proportion which the fœtus does; for the fmaller the fœtus is, the placenta is proportionally larger. The placenta generally adheres to, or near, the fundus of the womb, and is covered on the fide next to the womb, with a fine membranous continuation of the chorion.

The feparation of the placenta from the womb muft produce abortions, and this may be occafioned by different caufes operating in various manners, and requires very different treatment to prevent the lofs of the fœtus.

The ufe of the placenta is, together with the chorion, to abforb the nutritious juice from the mother's uterus, as the inteftines do the chyle; and finally to tranfmit it to the fœtus, by means of the umbilical veins. And it probably ferves to refund again to the parent, the blood and urine of the fœtus, by the umbilical arteries.

PLACENTA is alfo a term ufed, by fome botanifts, for what is more ufually called the receptacle of the feeds. See the article RECEPTACULUM SEMINUM.

PLACENTIA, a city of Spain, in the province of Eftramadura: weft long. 6°, north lat. 39° 45′.

PLACENTIA, a town of Spain, in the province of Guipufcoa, forty miles eaft of Bilboa.

PLACENTIA, a port-town of Newfoundland, fituated on a bay on the fouth-eaft part of the ifland: weft long. 56°, north lat. 48°.

PLACENTIA, or PIACENZA, a city of Italy, in the dutchy of Parma: eaft long. 10° 25′, north lat. 45°.

PLACITA, PLEAS, in a law-fenfe. See the article PLEA.

PLACITUM, in law, a fentence of a court, or an opinion, decree, or ordinance.

PLAFOND, or PLAFOUND, in architecture, the ceiling of a room, whether it be flat or arched, lined with plafter or joiner's work, and frequently enriched with painting.

The word plafond is alfo more particularly ufed for the bottom of the projecture of the larmier of the corniche, called alfo foffit. See the article SOFFITA.

PLAGIARY, in philology, the purloining another perfon's works, and putting them off for a man's own. Among the Romans, plagiarius was properly a perfon who bought, fold, or retained a freeman for a flave; and was fo called, becaufe by the Flavian law fuch perfons were condemned, ad plagas, to be whipped.

PLAGIURI, among ichthyologifts, one of the claffes of fifhes; comprehending all thofe which have the tails not perpendicular, but placed in an horizontal direction; and fuch are all the cetaceous fifhes, and they only, as the phyfeter, dolphin, monodon, catodon, and thrichechus. See PHYSETER, &c.

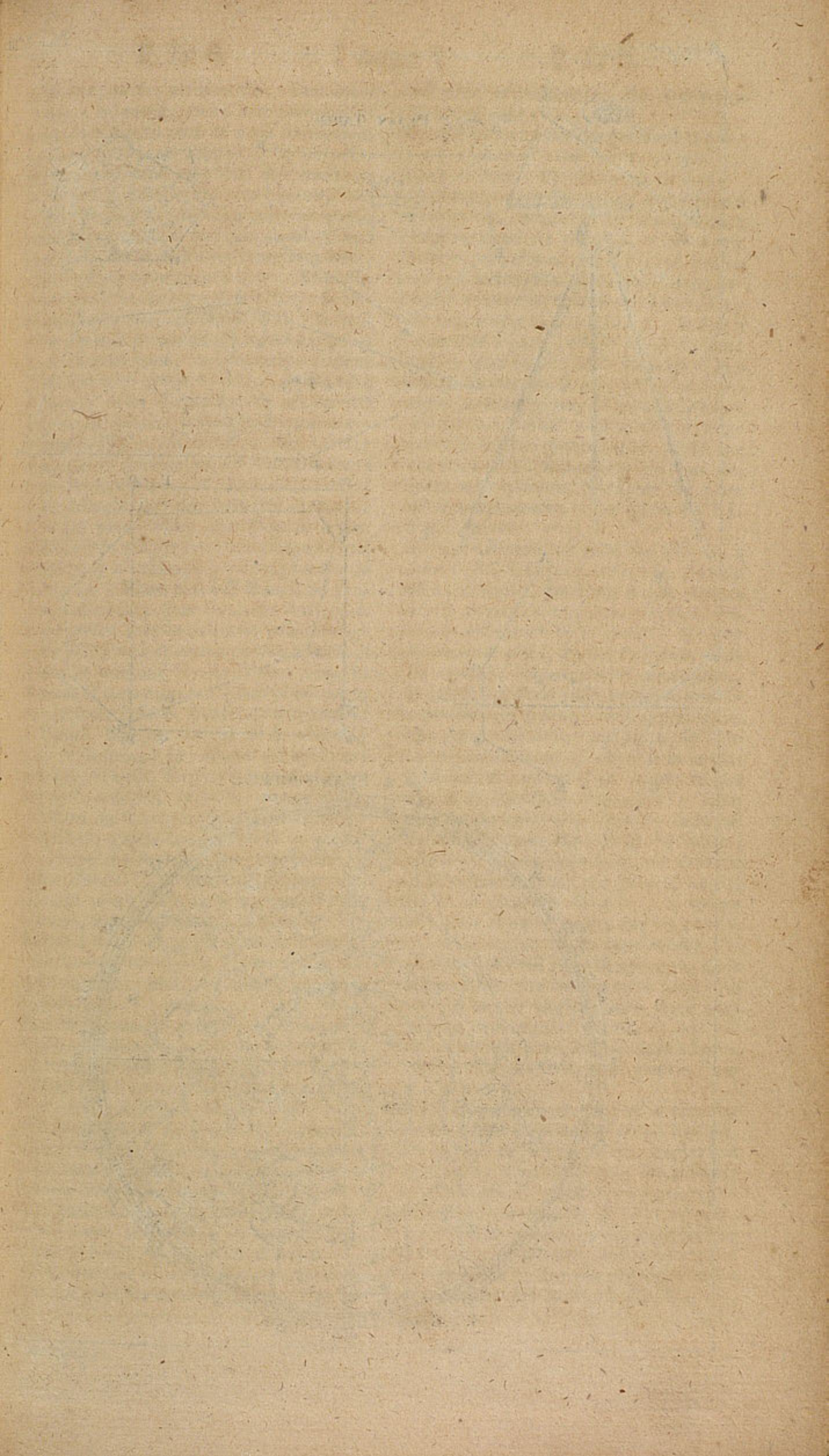
PLAGUE, PESTILENCE, or PESTILENTIAL FEVER, a moſt acute fever, ariſing from a poiſonous miaſma, brought from oriental countries, which, unleſs it is immediately expelled out of the body, by the ſtrength of the vital motions, by buboes and carbuncles, proves fatal.

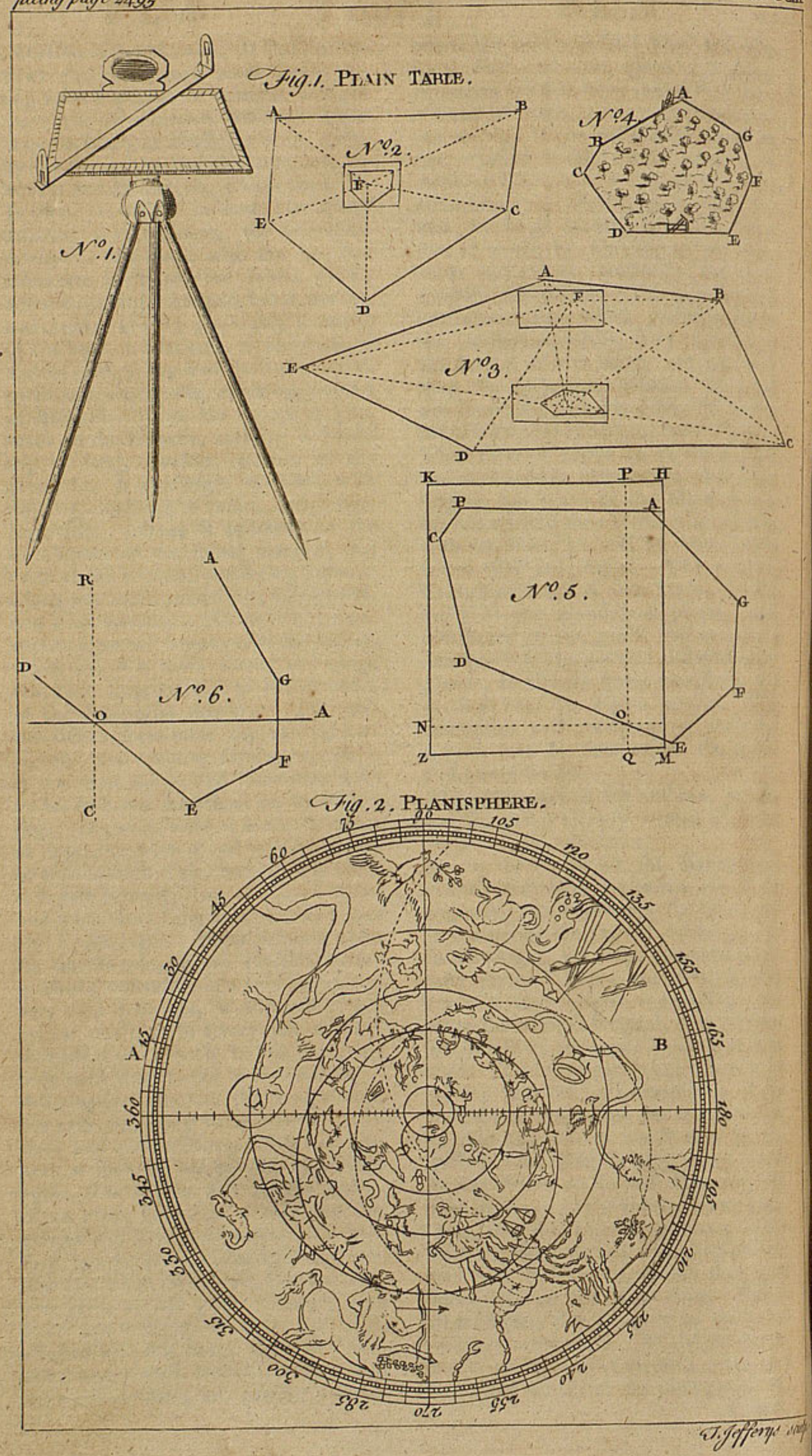
In this, as well as in moſt contagious diſeaſes, ſays Hoffman, the venomous miaſma is ſwallowed with the air, and inſinuates itſelf into the ſalival juice; whence it aſſaults the head, brain, nerves, and animal ſpirits; producing a torpor in the head, a heavineſs, a ſleepineſs, a violent pain, a ſtupor of the ſenſes, a forgetfulneſs, inquietude, watching, and loſs of ſtrength. From the fauces it proceeds to the ſtomach, creating a loathing of food, nauſeas, anxiety of the precordia, a cardialgia attended with fainting, reaching to vomit, and vomiting itſelf. Hence it proceeds to the membranes of the ſpinal marrow, the coats of the arteries, producing horrors, a languid, ſmall, contracted, quick pulſe, and even fainting. All which are generally ſigns and ſymptoms of the plague, which are of a more violent and quick operation in proportion to the virulence of the peſtilential miaſma. This diſeaſe differs from other contagious, malignant, and eruptive fevers, becauſe it is the moſt acute, and ſometimes kills on the firſt, and ſometimes on the ſecond day. In our climate it is not epidemic or ſporadic, from a bad way of living, or an unhealthful air, but happens when it is moſt ſalutary, from contagion alone, and is imported from hot countries where this diſeaſe rages. It will not only abate by intenſe cold, but be perfectly extinguiſhed: wherefore in a cold ſeaſon and very cold countries, it either does not appear at all, or in a very mild degree; whereas if the climate is hot, it is not only moſt violent, but moſt common.

All plagues are not of the ſame nature, but vary according to different conſtitutions and circumſtances; but all who have written of the plague univerſally agree, that ſpongy and porous bodies, of an obeſe habit, of a ſanguine and phlegmatico-ſanguine conſtitutions, women, young perſons and children, perſons of a timid diſpoſition, that are poor, live hard, or are given to luxury, and ſit up late at night, are more apt to be afflicted with this diſeaſe than the ſtrong and intrepid, lean, nervous, endued with large veſſels, men, old perſons obnoxious to the hæmorrhoidal flux, and who have iſſues and open ulcers. Nothing brings on this diſtemper ſooner than fear, a dread of death, and a conſternation of the mind. If the peſtilential poiſon is not expelled to the external parts, it is certainly fatal; nor is this to be done, according to Hoffman, as in other fevers, by large ſweats, by ſtools, by a flux of urine, by bleeding at the noſe, either natural or artificial: for theſe threaten deſtruction. The ſalutary and critical excretion which perfectly ſolves the peſtilential diſeaſe, is by tumours in the ſurface of the body, not otherwiſe than the eryſipelas, between the third and fourth day, and the ſooner the better, becauſe then the ſymptoms are mitigated. That there is poiſon contained in theſe tumours appears from hence, that if the ſurgeon opens any of the tumours with his lancet, and then bleeds a ſound man with the ſame, he will be immediately ſeized with the plague. The peſtilential tumours are of two kinds, the firſt ariſes in the glandulous places, moſt commonly in the groin and arm-pits; ſometimes in the parotid and mammary glands, as alſo the lower maxillary, and in thoſe near the aſpera arteria. The deſcription and treatment of theſe tumours, may be ſeen under the article *Peſtilential* BUBO.

The other ſort is the anthrax, or carbuncle, and is already treated of under the article CARBUNCLE.

As in the ſmall-pox the management conſiſts in clearing the primæ viæ in the beginning, in regulating the fever, and in promoting the natural diſcharges; ſo in the plague, the ſame indications will take place. When the fever is very acute, a cool regimen is neceſſary: but when the pulſe is languid, and the heat not exceſſive, moderate cordials muſt be uſed. The moſt gentle emetics may be given; the beſt is ipecacuhana, if the ſtomach or bowels are not inflamed, for in that caſe certain death may be expected. In France they bleed about twelve ounces on the firſt day, and then four or five ounces every two hours after. This, they ſay, had extraordinary ſucceſs with the aſſiſtance only of cooling ptiſans, and ſuch like drinks, which they gave plentifully at the ſame time. Sydenham adviſes, that ſweating be continued without intermiſſion. Dr. Mead recommends an infuſion of virginia ſnake-root in boiling water, as the moſt proper ſudorific;




Fig. 1. Plain Table.
No. 1.
No. 2.
No. 3.
No. 4.
No. 5.
No. 6.
Fig. 2. Planisphere.
T. Jefferys sculp.

dorific: or for want of that, ſome other warm aromatic, with the addition of about a fourth part of aqua theriacalis. Thoſe who are obliged to be near the ſick, muſt take care that the miaſmata do not approach the vital juices, nor yet the ſalival, to which purpoſe phyſicians recommend frequent ſpitting, and waſhing the mouth with vinegar or wine, or ſnuffing them up the noſe. The efficacy will be ſtill greater if they are imbued with rue, or citron-rind. It will be likewiſe proper to get a few ſpoonfuls of rheniſh wine, or bezoardic vinegar diluted with water or wine, and ſo take them. The Turks deal much in the juice of lemons. Externally many recommend the uſe of iſſues, becauſe the matter of the miaſma is wont to adhere to the ſerous part of the blood, and to be brought by the ſtrength of nature to the place where the iſſue is made. When the plague is actually begun, and the body is coſtive, a gentle clyſter ſhould be uſed. Then a ſweat ſhould be promoted twenty-four hours at leaſt, that the poiſon may exhale and paſs through the ſkin; and epithems to the heart will not be without benefit: they may be made of theriac, expreſſed oil of nutmegs, camphor, ſaffron, caſtor, and balſam of Peru. Langius recommends bleeding after ſweating: but above all acids are highly praiſed, ſuch as juice of citrons, Seville-oranges, lemons, vinegar, &c. When the ſtrength of the diſeaſe is vanquiſhed, gentle laxatives will be proper to expel the ſordes during the courſe of the diſeaſe. Mindererus aſſerts, that unleſs alexiterials be given twenty-four hours, all medicines are vain.

Plague-water, *aqua epidemica*, one of the compound waters of the ſhops, diſtilled from mint, roſemary, angelica-roots, &c.

PLAIN, *planus*, in general, an appellation given to whatever is ſmooth and even, or ſimple, obvious, and eaſy to be underſtood; and, conſequently, ſtands oppoſed to rough, enriched, or laboured.

A plain figure, in geometry, is an uniform ſurface; from every point of whoſe perimeter, right lines may be drawn to every other point in the ſame.

A plain angle is one contained under two lines, or ſurfaces, in contradiſtinction to a ſolid angle. See Angle.

The doctrine of plain triangles, as thoſe included under three right lines, is termed plain trigonometry. See the article Trigonometry.

Plain chart. See the article Chart.

Plain sailing. See Navigation.

Plain scale. See the article Scale.

Plain table, in ſurveying, a very ſimple inſtrument, whereby the draught of a field is taken on the ſpot, without any future protraction. It is generally of an oblong rectangular figure, and ſupported by a fulcrum, ſo as to turn every way by means of a ball and ſocket. It has a moveable frame, which ſerves to hold faſt a clean paper; and the ſides of this frame, facing the paper, are divided into equal parts every way. It has alſo a box with a magnetical needle, and a large index with two ſights: and, laſtly, on the edge of the frame, are marked degrees and minutes, to ſupply the place of a graphometer. See plate CCIII. fig. 1. n° 1.

1. To delineate or take the plot of a field ABCDE (*ibid.* n° 2.) by the help of a plain table, from one ſtation whence all its angles may be ſeen, and their diſtances meaſured by a chain. At any convenient place, F, let the plain table be erected; cover it with clean paper, in which let ſome point near the middle repreſent the ſtation: then applying, at this point, the index and ſights, ſo as to be moveable about it, direct it ſo as that ſome mark may be ſeen at one of the angles of the field, ſuppoſe A; from the ſtation-point F, draw a faint or dotted line along the ſide of the index; and having meaſured FA, the diſtance of the ſtation from the foreſaid angle, lay it off upon the faint line, by means of a ſcale of equal parts, and let a mark be made on the paper repreſenting the angle of the field A. Keeping the table immoveable, the ſame is to be done with the reſt of the angles; then right lines joining the angular points, ſo laid off upon the faint lines, ſhall include a figure exactly like the field, as is evident from Euclid's 5. 6.

2. To lay down the plot of a field by means of the plain table, at two ſtations, from each of which all the angles can be ſeen by meaſuring only the diſtance of the ſtations. Let the inſtrument be placed at the ſtation, F (*ibid.* n° 3.); then having choſen a point repreſenting it on the paper, let the index be applied at this point, ſo as to be moveable about it; next let the index be directed, ſucceſſively,

ceffively, to the feveral angles of the field; and when any angle is feen through the fights, draw an obfcure or dotted line along the fide of the index: and let the index be directed, in this manner, to the ftation G; and on the obfcure line drawn along its fide pointing to A, fet off from a fcale of equal parts a line correfponding to the meafured diftance of the ftations, and this will determine the point G. Then remove the inftrument to the ftation G; and applying the index to the line reprefenting the diftance of the ftations, place the inftrument fo that the firft ftation may be feen through the fights; and the inftrument remaining immoveable, let the index be applied at the point reprefenting the fecond ftation G, and be fucceffively directed by means of its fights, to all the angles of the field, drawing (as before) obfcure lines along the fide of the index; and the interfection of the two obfcure lines, drawn to the fame angle from the two ftations, will always reprefent that angle on the plan. Care being taken not to miftake thefe lines for one another, lines joining thofe interfections will form a figure on the paper like to the field.

3. To take the plot of a wood, park, or the like, by the plain-table, and meafuring round the fame. Suppofe ABCDEFG (*ibid.* n° 4.) to be the figure you would delineate upon the plain-table. Having put a fheet of paper upon the table, place your inftrument at the angle A, and direct your fights to the next angle at B, and by the fide thereof draw a line upon your table, as the line AB. Then meafure by the hedge-fide from the angle A to the angle B, which fuppofe twelve chains five links. Then from your fcale take twelve chains five links, and lay off upon your table from A to B. Then turn the index about, and direct the fights to G, and draw the line AG upon the table: but at prefent, you need not meafure the diftance.

Remove your inftrument from A, and fet up a mark where it laft ftood, and place your inftrument at the fecond angle B. Then laying the index upon the line AB, turn the whole inftrument about, till through the fights you fee the mark fet up at A, and there fcrew the inftrument. Then laying the index upon the point B, direct your fights to the angle C, and draw the line BC upon your table. Then meafuring the diftance BC four chains forty-five links, take that diftance from your fcale, and fet it upon your table from B to C.

Remove your inftrument from B, and fet up a mark in the room of it, and place your inftrument at C, laying the index upon the line CB; and turn the whole inftrument about, till through the fights you efpy the mark fet up at B, and there faften the inftrument. Then laying the index on the point C, direct the fights to D, and draw upon the table the line CD. Then meafure from C to D eight chains eighty-five links, and fet that diftance upon your table from C to D.

Remove the inftrument to D, placing a mark at C where it laft ftood, and lay the index upon the line DC, turning the whole inftrument about, till through the fights you fee the mark at C, and there faften the inftrument. Then lay the index on the point D, and direct the fights to E, and draw the line DE. Then with your chain meafure the diftance DE thirteen chains four links, which lay off on the table from D to E.

Remove your inftrument to E, placing a mark at D where it laft ftood, and, laying the index upon the line DE, turn the whole inftrument about, till through the fights you fee the mark at D, and there faften the inftrument. Then lay the index on the point E, and direct the fights to F, and draw the line EF. Then meafure the diftance EF feven chains feventy links, which take from your fcale, and lay off from E to F.

Remove your inftrument to F, placing a mark at E where it laft ftood, and lay the index upon the line EF, turning the inftrument about, till you fee the mark fet up at E, and there faften the inftrument. Then laying the index on the point F, direct the fights to G, and draw the line FG upon the table, which line FG will cut the line AG in the point G. Then meafure the diftance FG five chains fixty-feven links, and lay it off from F to G. Remove your inftrument to G, fetting a mark where it laft ftood, and lay the index upon the line FG, turning the whole inftrument about, till through the fights you fee the mark at F, and there faften the inftrument. Then laying the index upon the point G, direct your fights to A (your firft mark) and draw the line GA, which if you have truly wrought, will pafs directly through the point A, where you firft began.

In this manner may you take the plot of any

any champaign plain, be it never fo large. And here note, that very often hedges are of fuch thicknefs, that you cannot come near the fides or angles of the field, either to place your inftrument, or meafure the lines. Therefore, in fuch cafes you muft place your inftrument, or meafure your lines parallel to the fide thereof; and then your work will be the fame as if you meafured the hedge itfelf. Note alfo, That in thus going about the field, you may much help yourfelf by the needle. For looking what degree of the card the needle cuts at one ftation, if you remove your inftrument to the next ftation, and with your fights look to the mark where the inftrument laft ftood, you will find the needle to cut the fame degree again, which will give you no fmall fatisfaction in the profecution of your work. And, though there be a hundred or more fides, the needle will ftill cut the fame degrees at all of them, except you have committed fome former error: therefore, at every ftation have an eye to the needle.

4. Of fhifting the paper. In taking the plot of a field by the plain-table, and going about the fame, as before directed, it may fo fall out, if the field be very large, and when you are to take many inclofures together, that the fheet of paper upon the table will not hold all the work. But you muft be forced to take off that fheet, and put another clean fheet in the room thereof: and, in plotting of a manor or lordfhip, many fheets may be thus changed, which we call fhifting of paper. The manner of performing thereof is as follows:

Suppofe in going about to take the plot ABCDEFG (*ibid.* n° 5.) as before directed, that you having made choice of the angle at A for the place of the beginning, and proceed from thence to B, and from B to C, and from C to D, when you come to the angle at D, and are to draw DE, you want room to draw the fame upon the table; do thus:

Firft, through the point D draw the line DO, which is almoft fo much of the line DE as the table will contain. Then near the edge of the table HM, draw a line parallel to HM, by means of the inches and fubdivifions on the oppofite fides of the frame, as PQ, and another line at right angles to that through the point O, as ON. This being done, mark this fheet of paper, with the figure (1) about the middle thereof, for the firft fheet. Then taking this fheet off your table, put another clean fheet thereon, and draw upon it a line parallel to the contrary edge of the table, as the line RS (*ibid.* n° 6.). Then taking your firft fheet of paper, lay it upon the table fo, that the line PQ may exactly lie upon the line RS, to the beft advantage, as at the point O. Then with the point of your compaffes draw fo much of the line OD upon the clean fheet of paper as the table will hold. Having thus done, proceed with your work upon the new fheet, beginning at the point O; and fo going forward with your work, in all refpects as has been before directed; as from O to E, from E to F, from F to G, and from G to A; fhifting your paper as you have occafion.

PLAIN NUMBER, is a number that may be produced by the multiplication of two numbers into one another: thus 20 is a plain number produced by the multiplication of 5 into 4.

PLAIN PLACE, *locus planus*, or *locus ad planum*, among the antient geometricians, denoted a geometrical locus, when it was a right line or a circle, in oppofition to a folid place, which was an ellipfis, parabola, or hyperbola. Thefe the moderns diftinguifhed into loci ad rectam, and loci ad circulum. See LOCUS.

PLAIN PROBLEM, in mathematics, is fuch a problem as cannot be folved geometrically, but by the interfection either of a right line and a circle, or of the circumferences of two circles; as, given the greateft fide, and the fum of the other two fides of a right-angled triangle, to find the triangle, as alfo to defcribe a trapezium that fhall make a given area of four given lines. Such problems can only have two folutions, in regard a right line can only cut a circle, or one circle cut another in two points.

PLAIN, in heraldry, fometimes denotes the point of the fhield, when couped fquare; a part remaining under the fquare, of a different colour or metal from the fhield. This has been fometimes ufed as a mark of baftardy, and called champaigne; for, when the legitimate defcendants of baftards have taken away the bar, fillet, or traverfe borne by their fathers, they are to cut the point of the fhield with a different colour called plain.

PLAINT, in law, the exhibiting any action, real or perfonal, in writing. See the article ACTION.

PLAISE, the englifh name of a fpecies of the

the pleuronectes, with smooth sides, a spine near the anus, and the eyes and six tubercles placed on the right side of the head: it is somewhat larger than the flounder. See PLEURONECTES.

PLAISTER, or PLASTER. See the article PLASTER.

PLAN, in general, denotes the representation of something drawn on a plane: such are maps, charts, ichnographies, &c. See the articles MAP, CHART, &c.

The term plan, however, is particularly used for a draught of a building, such as it appears, or is intended to appear, on the ground; shewing the extent, division, and distribution of its area, or ground-plot, into apartments, rooms, passages, &c. See BUILDING.

A geometrical plan is that, wherein the solid and vacant parts are represented in their natural proportions.

The raised plan of a building, is the same with what is otherwise called an elevation, or orthography. See the article ORTHOGRAPHY.

A perspective plan, is that exhibited by degradations, or diminutions, according to the rules of perspective. See the article PERSPECTIVE.

To render plans intelligible, it is usual to distinguish the massives, with a black wash; the projectures on the ground, are drawn in full lines, and those supposed over them in dotted lines. The augmentations, or alterations, to be made, are distinguished by a colour different from what is already built; and the tints of each plan made lighter, as the stories are raised.

In large buildings, it is usual to have three several plans, for the three first stories.

PLANCHIER, or PLANCERE, in architecture, the under part of the corona, or drip, making the superior part of the corniche, between two cymatiums. See CORNICHE and CYMATIUM.

PLANE, *planum*, in geometry, denotes a plain surface, or one that lies evenly between its bounding lines: and as a right line is the shortest extension from one point to another, so a plain surface is the shortest extension from one line to another.

In astronomy, conics, &c. the term plane, is frequently used for an imaginary surface, supposed to cut and pass through solid bodies; and on this foundation, is the whole doctrine of conic sections built. See CONIC SECTIONS.

For the inclination of the planes of the orbits of the planets, see the articles ORBIT, INCLINATION and PLANET.

In mechanics, planes are either horizontal, that is, parallel to the horizon, or inclined thereto. See the articles HORIZON, and INCLINED PLANE.

The determining how far any given plane, deviates from an horizontal one, makes the whole business of levelling. See the article LEVELLING.

In optics, the planes of reflection and refraction, are those drawn through the incident and reflected or refracted rays. See the articles INCIDENCE, REFLECTION, and REFRACTION.

The plane of the horopter, is that drawn through the horopter, perpendicularly to the plane of the two optical axes. See the article HOROPTER.

In perspective, we meet with the perspective plane, which is supposed to be pellucid, and perpendicular to the horizon; the horizontal plane, supposed to pass through the spectator's eye, parallel to the horizon; the geometrical plane, likewise parallel to the horizon, whereon the object to be represented is supposed to be placed, &c. See PERSPECTIVE.

The plane of projection, in the stereographic projection of the sphere, is that on which the projection is made; corresponding to the perspective plane. See the articles MAP and PROJECTION.

For the inclination and declination of planes, see the articles INCLINATION and DECLINATION.

PLANE, in joinery, an edged tool, or instrument for parting and shaving of wood smooth. See plate of JOINERY.

It consists of a piece of wood, very smooth at bottom, as a stock or shaft; in the middle of which is an aperture, through which a steel-edge, or chissel, placed obliquely, passes, which being very sharp, takes off the inequalities of the wood it is slid along.

Planes have various names, according to their various forms, sizes, and uses: as, 1. The fore-plane, which is a very long one, and is usually that which is first used: the edge of its iron or chissel is not ground straight, but rises with a convex arch in the middle; its use is to take off the greater irregularities of the stuff, and to prepare it for the smoothing-plane. 2. The smoothing-plane is short and small, its chissel being finer: its use is to take off the greater irregularities left by the fore-plane, and to prepare the wood for the jointer. 3. The jointer is the

the longeft of all; its edge is very fine, and does not ftand out above an hair's breadth: it is chiefly ufed for fhooting the edge of a board perfectly ftraight, for jointing tables, &c. 4. The ftrike-block, which is like the jointer, but fhorter: its ufe is to fhoot fhort joints. 5. The rabbit-plane, which is ufed in cutting the upper edge of a board, ftraight or fquare, down into the ftuff, fo that the edge of another cut after the fame manner, may join in with it, on the fquare; it is alfo ufed in ftriking facias on mouldings: the iron or chiffel of this plane is as broad as its ftock, that the angle may cut ftraight, and it delivers its fhavings at the fides, and not at the top, like the others. 6. The plough, which is a narrow rabbit-plane, with the addition of two ftaves, on which are fhoulders: its ufe is to plow a narrow fquare groove on the edge of a board. 7. Moulding-plane, which are of various kinds, accommodated to the various forms and profiles of the moulding; as the round-plane, the hollow-plane, the ogee, the fnipe's bill, &c. which are all of feveral fizes from half an inch, to an inch and a half.

PLANE-TREE, *platanus*, in botany, a genus of the monoecia-polyandria clafs of plants, the male corolla whereof is fcarce vifible: the female one confifts of feveral concave, oblong, and clavated petals: there is no pericarpium, feveral of the fruits conftituting a round, rough ball; the feed, which ftands upon a fetaceous ftyle, is roundifh, and is terminated by a fubulated ftyle, and there is a capillary down adhering to its bafe.

This tree grows to a very confiderable fize, and is ramofe and fpreading; the bark is fmooth; the wood firm, and pale-coloured; and the leaves are very large, of a palmated figure, and divided into fix or feven parts at the edge.

PLANET, *planeta*, πλανήτης, a celeftial body, revolving round the fun as a center, and continually changing its pofition, with refpect to the fixed ftars; whence the name planet, which is a greek word, fignifying wanderer.

The planets are ufually diftinguifhed into primary, and fecondary. The primary ones, called, by way of eminence, planets, are thofe which revolve round the fun as a center; and the fecondary planets, more ufually called fatellites, or moons, are thofe which revolve round a primary planet as a center, and conftantly attend it in its revolution round the fun. See SATELLITE, and MOON. The primary planets are again diftinguifhed into fuperior and inferior. The fuperior planets, are thofe further from the fun than our earth; as mars, jupiter, and faturn: and the inferior planets, are thofe nearer the fun than our earth, as venus and mercury; for the aftronomy, and other peculiarities, of which, fee MARS, JUPITER, &c.

Nature of the PLANETS. That the planets are opake bodies, like our earth, appears evident for the following reafons. 1. Since in venus, mercury, and mars, only that part of the difk illuminated by the fun, is found to fhine; and, again, venus and mercury, when between the earth and the fun, appear like dark fpots or maculæ, on the fun's difk; it is evident, that mars, venus, and mercury are opake bodies, illuminated with the borrowed light of the fun. And the fame appears of jupiter, from its being void of light in that part to which the fhadow of the fatellites reaches, as well as in that part turned from the fun; and that his fatellites are opake, and reflect the fun's light, is abundantly fhewn. Wherefore, fince faturn, with his ring and fatellites, only yield a faint light, fainter confiderably than that of the fixed ftars, though thefe be vaftly more remote; and than that of the reft of the planets: it is paft doubt, he too, with his attendants, are opake bodies. 2. Since the fun's light is not tranfmitted through mercury and venus, when placed againft him, it is plain they are denfe opake bodies; which is likewife evident of jupiter, from his hiding the fatellites in his fhadow; and therefore, by analogy, the fame may be concluded of faturn. 3. From the variable fpots in venus, mars, and jupiter, it is evident thefe planets have a changeable atmofphere; which changeable atmofphere may, by a like argument, be inferred of the fatellites of jupiter, and therefore by fimilitude the fame may be concluded of the other planets. 4. In like manner, from the mountains obferved in venus, the fame may be fuppofed in the other planets. 5. Since then, faturn, jupiter, both their fatellites, mars, venus, and mercury, are opake bodies, fhining with the fun's borrowed light, are furnifhed with mountains, and encompaffed with a changeable atmofphere; they have, of confe-

consequence, waters, seas, &c. as well as dry land, and are bodies like the moon, and therefore like the earth. *Q. E. D.*

And hence, it seems highly probable, that the other planets have their animal inhabitants, as well as our earth.

Motion of the PLANETS. Each of the primary planets bend their course about the center of the sun, and are accelerated in their motions as they approach to him, and retarded as they recede from him; so that a ray, drawn from any one of them to the sun, always describes equal spaces, or areas, in equal times: whence it follows, that the power which bends their way into a curve line, must be directed to the sun. This power is no other than that of gravitation, which we have already proved to increase, as the square of the planet's distance from the sun decreases. See the articles GRAVITATION, ORBIT, &c.

But the universality of this law still farther appears, by comparing the motions of the different planets: for the power which acts on a planet near the sun, is manifestly greater than that which acts on a planet more remote; both because it moves with greater velocity, and because it moves in a lesser orbit, which has more curvature, and separates farther from its tangent, in arcs of the same length, than in a greater orbit. By comparing the motion of the planets, the velocity of a nearer planet is found to be greater than that of one more remote, in the proportion of the square-root of the number which expresses the greater distance, to the square-root of that which expresses the lesser distance; so that if one planet was four times farther from the sun than another, the velocity of the first would be half the velocity of the latter; and the nearer planet would describe an arc in one minute, equal to the arc described by the other planet in two minutes: and tho' the curvature of the orbits was the same, the nearer planet would describe, by its gravity, four times as much space, as the other would describe in the same time; so that the gravity of the nearer planet would appear to be quadruple, from the consideration of its greater velocity only. But besides this, as the radius of the lesser orbit is supposed to be four times less than the radius of the other, the lesser orbit must be four times more curve; and the extremity of a small arc, of the same length, will be four times farther below the tangent, drawn at the other extremity, in the lesser orbit than in the greater; so that, though the velocities were equal, the gravity of the nearer planet would, on this account only, be found to be quadruple. Hence, on both these accounts together, the greater velocity of the nearer planet, and the greater curvature of its orbit, its gravity towards the sun must be supposed sixteen times greater, though its distance from the sun is only four times less than that of the other; that is, when the distances are as 1 to 4, the gravities are reciprocally as the squares of these numbers, or as 16 to 1.

And in the same manner as this principle governs the motions of the primary planets of the great solar system, acts at their surfaces, and keeps their parts together; so it governs also the motions of the satellites, or secondary planets, in the lesser systems of which the greater is composed, and is extended around them, decreasing in the same manner as the squares of the distances increase. Nay the comets seem evidently to be governed by the same law, since they descend with an accelerated motion, as they approach towards the sun, and ascend again with a retarded motion, bending their way about the sun, and describing equal areas in equal times, by rays drawn from them to his center.

For the various systems that have been formed concerning the planets, see the articles COPERNICAN, PTOLEMAIC, TYCHONIC, &c.

And as to their distances, diameters, orbits, inclination of their orbits, &c. they will be found under the articles DISTANCE, DIAMETER, ORBIT, INCLINATION, &c.

PLANETARIUM, an astronomical machine, so called from its representing the motions, orbits, &c. of the planets, agreeably to the copernican system. See the article COPERNICAN.

The planetarium is more generally known by the name orrery, and therefore we have given its description and use under that article. See ORRERY.

PLANETARY, something relating to the planets. See the article PLANET.

Thus we meet with planetary days, hours, years, systems, &c. See the articles DAY, HOUR, &c.

PLANIMETRY, that part of geometry which

which confiders lines and plain figures, without confidering their height or depth. See the articles TRIANGLE, SQUARE, SURVEYING, &c.

PLANISPHERE, fignifies a projection of the fphere, and its various circles on a plane; in which fenfe maps, wherein are exhibited the meridians, and other circles of the fphere, are planifpheres. See the articles MAP, PROJECTION, CIRCLE, SPHERE, &c.

PLANISPHERE, is more particularly ufed for an aftronomical inftrument ufed in obferving the motions of the heavenly bodies.

It confifts of a projection of the celeftial fphere upon a plane, reprefenting the ftars, conftellations, &c. in their proper order; fome being projected on the meridian, and others on the equator.

Among all thefe planifpheres, that of M. Caffini feems to deferve the preference: it is compofed of two circular, but unequal plates, A and B (plate CCIII. fig. 2.) whereof the leaft, B, is fo fitted within the other, as to turn round upon the center, whilft the larger circle, A, remains immoveable. On the leffer plate are delineated the conftellations of the northern hemifphere, with its feveral circles. The limb of the inferior plate, A, is divided into three hundred and fixty degrees, and into twenty-four hours, which are reckoned from twelve to twelve, and each hour into fixty minutes. Between the two oppofite hours, twelve and twelve, is extended a filver-thread, which paffing over the center, or northern pole, reprefents the meridian. If then the fouth point be turned towards the obferver, the femi-circle towards the left hand will be the eaft, and that on the right the weft; and the hours on the former will be thofe of the forenoon, and the hours on the latter thofe of the afternoon.

Ufe of the PLANISPHERE. 1. To reprefent the face of the heavens for any day and hour: find, on the leffer moveable plate, the month and day propofed, and turn the plate till the given day of the month ftand againft the hour and minute required; and the plate will then reprefent the face of the heavens, by fhewing what ftars are then rifing in the meridian, or what fetting. 2. To know at what hour and minute any ftar rifes or fets, &c. Turn the moveable plate, till the given ftar reaches the horizon, eaft or weft, and againft the given day, on the moveable plate, is the hour and minute on the exterior or immoveable one: and in the fame manner may moft of the problems, ufually refolved by the celeftial globe, be determined.

Nautical PLANISPHERE. See the article NAUTICAL.

PLANO-CONCAVE, and PLANO-CONVEX-LENSES. See the article LENS.

PLANT, *planta*, is defined to be an organical body, deftitute of fenfe and fpontaneous motion, adhering to another body in fuch a manner as to draw from it its nourifhment, and having power of propagating itfelf by feeds.

As to the parts of which a plant confifts, they are the root, ftalk, leaf, flower, and fruit. See ROOT, STALK, &c.

Plant and vegetable are pretty near terms fynonymous, every plant being a vegetable. Now Dr. Boerhaave defines a vegetable to be a body generated of the earth, or fomething arifing out of the earth, to which it adheres, or is connected, by parts called roots, through which it receives the matter of its nourifhment and increafe; and confifts of juices and veffels fenfibly diftinct from each other: or, a vegetable is an organical body, compofed of veffels and juices every where diftinguifhable from each other; to which body grow roots or parts, whereto it adheres, and from which it derives the matter of its life and growth.

This definition furnifhes a juft and adequate idea of a vegetable; for by its confifting of diftinct veffels and juices, it is diftinguifhed from a foffil; and by its adhering to another body, from which it derives its nourifhment, and being deftitute of fenfation, it is fufficiently diftinguifhed from an animal. See the articles FOSSIL and ANIMAL.

The veffels, or containing parts of plants, confift chiefly of earth, bound or connected together by oil, as a gluten; which being exhaufted by fire, air, age, or the like, the plant moulders, or returns again into its earth or duft: but it muft be owned, that water, air, falt, and fulphur or oil, are likewife conftituent parts of plants, fince they can be all obtained by a well managed analyfis. See AIR, WATER, SALT, &c.

The root, or part whereby plants are connected to their matrix, and by which they receive their nutritious juice, confifts of an infinite number of abforbent veffels, which being difperfed through the interftices of the earth, attract or imbibe the juices

juices of the fame; confequently, every thing in the earth that is diffoluble in water, is liable to be imbibed, as air, falt, oil, and fumes of minerals, metals, &c. and of thefe plants do really confift.

The motion of thefe nutritious juices is not unlike that of the blood in animals, being effected by the action of the air. The difcovery of this we owe to the admirable Malpighi, who firft obferved, that plants confift of two feries or orders of veffels: 1. Such as receive and diftribute the alimentary juices, anfwering to the arteries, lacteals, veins, &c. of animals. 2. The tracheæ, or air-veffels, which are long hollow pipes, wherein air is commonly received and expelled; that is, infpired and expired. Hence it follows, that the heat of the fun muft have a ftrong effect on the air included in thefe tracheæ; whence arifes a perpetual fpring of action, to promote the circulation of the juices in plants.

For the botanical diftribution of plants into claffes, genera, &c. fee the articles BOTANY, GENUS, &c.

And as to the elements, or conftituent parts of plants, they will be found under the articles ELEMENT, OIL, SALT, &c.

Parafitical PLANTS. See PARASITES.

Senfitive PLANT. See SENSITIVE.

Foffil PLANTS, thofe found buried in the earth, and lodged in almoft all the kinds of ftrata, or fubftances, to be met with there. See plate CCIV.

The moft frequent foffil plants are the polypody, fpleenwort, ofmund, trichomanes, and the feveral larger and fmaller ferns; but befide thefe there are alfo found pieces of the equifetums, or horfetails, and joints of the ftellated plants, as the clivers, madder, and the like: and thefe have been too often miftaken for flowers. Sometimes there are alfo found complete graffes, or parts of them; as alfo reeds and other water-plants; fometimes the ears of corn, and not unfrequently the twigs or bark, and impreffions of the bark, and fruit of the pine or fir-kind, which have been, from their fcaly appearance, miftaken for the fkins of fifhes; and fometimes, but that very rarely, we meet with moffes and fea-plants.

Many of the ferns, not unfrequently found, are of very fingular kinds, and fome fpecies yet unknown to us; and the leaves of fome appear fet at regular diftances, with round protuberances and cavities. The ftones which contain thefe plants fplit readily, and are often found to contain, on one fide, the impreffion of the plants; and on the other the prominent plant itfelf: and befide all that have been mentioned, there have been frequently fuppofed to be found with us ears of common wheat, and of the maiz or indian corn; the firft being in reality no other than the common endmoft branches of the firs, and the other the thicker boughs of various fpecies of that and of the pine-kind, with their leaves fallen off; fuch branches, in fuch a ftate, cannot but afford many irregular tubercles and papillæ, and in fome fpecies, fuch as are more regularly difpofed.

Thefe are the kinds moft obvious in England; and thefe are either immerfed in the flaty ftone which conftitutes the whole ftrata, or in flatted nodules, ufually of about three inches broad, which readily fplit into two pieces on being ftruck.

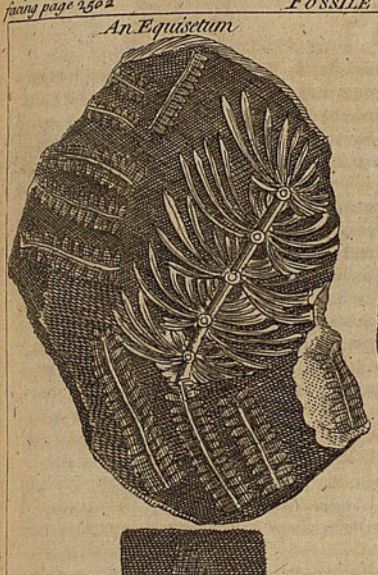
Though thefe feem the only fpecies of plants found with us, yet in Germany there are many others, and thofe found in different fubftances. A whitifh ftone, a little harder than chalk, frequently contains them: they are found alfo often in a grey flaty ftone, of a firmer texture; not unfrequently in a blackifh one; and, at times, in many others. Nor are the bodies themfelves lefs various here than the matter in which they are contained: the leaves of trees are found in great abundance, among which thofe of the willow, poplar, whitethorn, and pear-trees, are the moft common; fmall branches of box, leaves of the olive tree, and ftalks of garden-thyme, are alfo found there; and fometimes ears of the various fpecies of corn, and the larger as well as the fmaller moffes in great abundance.

Thefe feem the tender vegetables, or herbaceous plants, certainly found thus immerfed in hard ftone, and buried at great depths in the earth; others of many kinds there are alfo named by authors, but as in bodies fo imperfect, errors are eafily fallen into, thefe feem all that can be afcertained beyond mere conjecture.

PLANTA, in anatomy, the fole of the foot. See the article FOOT.

PLANTAGO, the PLANTAIN TREE, in botany. See the next article.

PLANTAIN, *plantago*, in botany, a plant















T. Jefferys sculp

plant of the tetrandria monogynia clafs, the flower whereof confifts of one petal, ufually wide expanded at the mouth, and with the limb divided into four oval fegments: the fruit is a bilocular capfule, of an ovated figure, containing a great many oblong feeds.

The root, leaves, and feeds of plantain, are ufed in medicine, and reckoned cooling and aftringent; being much recommended in fluxes of all kinds, particularly hæmorrhages, whether from the nofe, mouth, or uterus. It is likewife accounted a great healer of frefh wounds.

Ribwort, and bucks-horn plantain, are two fpecies of, and agree with, plantain in virtues.

Water-PLANTAIN, *ranunculus*. See the article RANUNCULUS.

PLANTARIS, in anatomy, one of the extenfor-mufcles of the foot, which has its origin from the interior part of the external condyle.

PLANTATION, in the Weft-Indies, denotes a fpot of ground which a planter or perfon, arrived in a new colony, pitches on to cultivate for his own ufe, or is affigned for that purpofe. However, the term plantation is often ufed in a fynonymous fenfe with colony. See the article COLONY.

The britifh plantations in America, are, befides the iflands of Jamaica, Barbadoes, &c. thofe of Virginia, Maryland, New-England, New-York, Carolina, Georgia, Penfylvania, New-Scotland, &c. See VIRGINIA, &c.

By ftat. 12 Car. II. and 11 and 12 Will. III. all governors of the plantations are, at their entrance, to take an oath, that, to their utmoft, they fhall fee the acts of parliament made concerning the faid colonies put in execution; and on failure, complaint being made to the king, fuch a governor is to be removed, and forfeit the fum of one thoufand pounds. If any governor, deputy-governor, &c. opprefs any of the king's fubjects under their government, or act any ways contrary to the laws of this realm, or in force within their governments, &c. it fhall be determined in the court of king's bench in England, and the fame punifhment inflicted as ufual for fuch offences in England.

And by 7 and 8 Will. III. all laws, cuftoms, &c. practifed in any of the plantations that are repugnant to any laws already made, or to any law hereafter to be made, relating to thofe plantations, are declared null and void. And all places of truft in the courts of law, or relating to the treafury, in any ifland or colony, fhall be held by native-born fubjects of Great-Britain, Ireland, or of the faid colonies. Alfo all perfons, claiming any right in any of them, fhall not difpofe of the fame to any but natural born fubjects; and all governors appointed by fuch proprietors, fhall be approved by his majefty, and take the oaths accordingly.

By 5 Geo. II. c. 7. all real eftates in the plantations fhall be chargeable with all juft debts whatfoever, and fubject to the like remedies and proceedings as in England. And for the more eafy recovery of debts in the colonies, in which any perfon refiding in Great-Britain fhall be party, fuch debt may be proved. Here an oath before any chief magiftrate near where the perfon fhall refide; and being certified under the common feal of the city or town, fhall be of the fame force as if the perfon had appeared in open court, or upon commiffion.

By 6 Geo. II. c. 13. all fugars and paneles of the product of any plantation not under his majefty's dominion, imported into any of his majefty's plantations, fhall pay five fhillings for every hundred weight; and for all rum, or fpirits of foreign produce, nine pence per gallon; and for molaffes, fix pence per gallon. And, on importation, an entry fhall be made by the proper officers, &c. and the duties paid down in ready money before landing the goods, on pain of forfeiture. And by the fame act, fugars, rum, &c. not the produce of britifh plantations, are prohibited to be imported into Ireland.

By 5 Geo. II. c. 22. no hats or felts fhall be exported from one britifh plantation to another, on penalty of five hundred pounds and forfeiture of the goods; and perfons aiding and affifting therein, fhall forfeit forty pounds. This ftatute alfo regulates the trade of felt-making, &c. and no perfon fhall retain in the faid art any negro, on forfeiture of five pounds for every month.

For other regulations concerning the britifh plantations and the trade to and from them, fee NAVAL AFFAIRS.

By a proclamation of queen Anne's, the currency of the foreign coins, in the plantations, was fettled as follows: Seville pieces of eight, old plate, feventeen penny-weight twelve grains, at four

four ſhillings and ſixpence; Seville pieces of eight, new plate, fourteen penny weight, at three ſhillings and ſeven pence farthing; Mexico pieces of eight, ſeventeen penny-weight twelve grains, at four ſhillings and ſix pence, pillar pieces of eight, ſeventeen penny-weight, twelve grains, at four ſhillings and ſix pence three farthings; Peru pieces of eight, old plate, ſeventeen penny-weight twelve grains, at four ſhillings and five pence; croſs-dollars, eighteen penny-weight, at four ſhillings and four pence three farthings; ducatoons of Flanders, twenty penny-weight and twenty-one grains at five ſhillings and ſix pence; ecus, or crowns of France, ſeventeen penny-weight twelve grains, at four ſhillings and ſix pence; cruſadoes of Portugal, eleven penny-weight four grains, at two ſhillings and ten pence farthing; three guilder pieces of Holland, twenty penny-weight and ſeven grains, at five ſhillings and two pence farthing; old rix-dollars of the empire, eighteen penny-weight and ten grains, at four ſhillings and ſix pence; and the halves, quarters, and other parts in proportion to their denominations, and light pieces in proportion to their weight.

Strength of the britiſh PLANTATIONS. The encroachments of the French upon the britiſh plantations, the number of whoſe inhabitants is more than three times that of French both in Canada and Louiſiana put together, is certainly a very great indignity offered to his majeſty and the nation; eſpecially ſince the Engliſh planted and improved them, from the ſea-coaſts almoſt up to the ſources of the largeſt rivers, by the conſent of the natives, whoſe lands they have actually purchaſed and paid for; and whoſe traffic we may be entirely deprived of, if the French do not meet with an effectual check; which, could proper meaſures be taken to make the ſeveral colonies of New England, New York, New Jerſey, Penſilvania, Maryland, Virginia, and North and South Carolina act in concert, may very eaſily be done: but the miſchief is, all theſe colonies are independent on each other, and have different views and intereſts; which makes it next to impoſſible to draw any conſiderable body of forces together on an emergency, though the ſafety and preſervation, not only of any particular colony, but of all the britiſh plantations on the american continent, were ever ſo nearly concerned. To remedy this inconvenience, ſome have, with the utmoſt deference to his majeſty and his miniſters, propoſed, that all the colonies appertaining to the crown of Great Britain on the northern continent of America, be united under a legal, regular, and firm eſtabliſhment; and that a lieutenant-general be appointed, to whom the governors of each province ſhall be ſubordinate: alſo that an aſſembly compoſed of a certain number of deputies from each province, ſhall have power to ſettle and appoint what quotas or proportions of men, money, &c. each province is to raiſe for their mutual defence; and if neceſſary, for offence and invaſion of their enemies; in all which caſes, the lieutenant or governor general is to have a negative, but not to enact any thing without the concurrence of the majority of them. Such a coalition, tempered with, and founded on prudence, moderation and juſtice, could not fail to lay a laſting and ſure foundation of ſuch ſtrength and proſperity, as would enable the plantations to defend themſelves againſt their enterprizing and ambitious neighbours.

PLANTING, in agriculture and gardening, is ſetting a tree or plant taken from its proper place, in a new hole or pit; throwing freſh earth over its root, and filling up the hole to the level of the ſurface of the ground.

The firſt thing in planting is to prepare the ground before the trees or plants are taken out of the earth, that they may remain out of the ground, as ſhort a time as poſſible, and the next is to take up the trees or plants in order to their being tranſplanted. In taking up the trees, carefully dig away the earth round the roots, ſo as to come at their ſeveral parts to cut them off; for if they are torn out of the ground without care, the roots will be broken and bruiſed to the great injury of the trees. When you have taken them up, the next thing is to prepare them for planting by pruning the roots and heads. And firſt, as to the roots; all the ſmall fibres are to be cut off, as near to the place from whence they are produced, as may be, except they are to be replanted immediately after they are taken up. Then prune off all the bruiſed or broken roots, all ſuch as are irregular, and croſs each other, and all downright roots, eſpecially in fruit-trees: ſhorten the larger roots in proportion to the age, the ſtrength, and nature

nature of the trees; obferving that the walnut, mulberry, and fome other tender-rooted kinds fhould not be prunned fo clofe as the more hardy forts of fruit and foreft-trees: in young fruit trees, fuch as pears, apples, plumbs, peaches, *&c.* that are one year old from the time of their budding or grafting, the roots may be left only about eight or nine inches long; but in older trees, they muft be left of a much greater length: but this is only to be underftood of the larger roots; for the fmall ones muft be chiefly cut quite out, or pruned very fhort. The next thing is the pruning of their heads, which muft be differently performed in different trees; and the defign of the trees muft alfo be confidered: thus, if they are defigned for walls or efpaliers, it is beft to plant them with the greateft part of their heads, which fhould remain on till they begin to fhoot in the fpring, when they muft be cut down to five or fix eyes, at the fame time taking care not to difturb the roots. But if the trees are defigned for ftandards, you fhould prune off all the fmall branches clofe to the place where they are produced, as alfo the irregular ones which crofs each other; and after having difplaced thefe branches, you fhould alfo cut off all fuch parts of branches, as have by any accident been broken or wounded; but by no means cut off the main leading fhoots which are neceffary to attract the fap from the root, and thereby promote the growth of the tree. Having thus prepared the trees for planting, you muft now proceed to place them in the earth; but firft if the trees have been long out of the ground, fo that the fibres of the roots are dried, place them eight or ten hours in water, before they are planted, with their heads erect, and the roots only immerfed therein, which will fwell the dried veffels of the roots, and prepare them to imbibe nourifhment from the earth. In planting them, great regard fhould be had to the nature of the foil; for if that be cold and moift, the trees fhould be planted very fhallow; and if it be a hard rock or gravel, it will be better to raife a hill of earth where each tree is to be planted, than to dig into the rock or gravel, and fill it up with earth, as is too often practifed, by which means the trees are planted, as it were in a tub, and have but little room to extend their roots. The next thing to be obferved is, to place the trees in the hole in fuch a manner that the roots may be about the fame depth in the ground, as before they were taken up: then break the earth fine with a fpade, and fcatter it into the hole, fo that it may fall in between every root, that there may be no hollownefs in the earth: then having filled up the hole, gently tread down the earth with your feet, but do not make it too hard; which is a great fault, efpecially if the ground be ftrong or wet. Having thus planted the trees, they fhould be faftened to ftakes driven into the ground, to prevent their being difplaced by the wind, and fome mulch laid about the furface of the ground about their roots: as to fuch as are planted againft walls, their roots fhould be placed about five or fix inches from the wall, to which their heads fhould be nailed to prevent their being blown up by the wind. The feafons for planting are various, according to the different forts of trees, or the foil in which they are planted: for the trees whofe leaves fall off in winter, the beft time is the beginning of October, provided the foil be dry; but if it be a very wet foil it is better to defer it till the latter end of February, or the beginning of March; and for many kinds of evergreens, the beginning of April is by far the beft feafon; though they may be fafely removed at Midfummer, provided they are not to be carried very far; but you fhould always make choice of a cloudy wet feafon.

For other obfervations on planting, fee the articles NURSERY, KITCHEN-GARDEN, ORCHARD, GROVE, *&c.*

Reverfe PLANTING, a method of planting in which the natural pofition of the plant, or fhoot is inverted; the branches being fet into the earth, and the root reared into the air. Dr. Agricola mentions this monftrous method of planting, which he found to fucceed very well, in moft or all forts of fruit trees, timber trees, *&c.* Bradley affirms that he has feen a lime tree in Holland growing with its firft roots in the air, which had fhot out branches in great plenty, at the fame time that its firft branches produced roots and fed the tree. Mr. Fairchild, of Hoxton, has practifed the fame with us, and gives the following directions for performing it: make choice of a young tree of one fhoot, of alder, elm, willow, or any other tree that eafily takes root by laying; bend the fhoot gently down into the earth, and fo let it remain till it has taken

taken root. Then dig about the firft root, and raife it gently out of the ground, till the ftem be nearly upright, and ftake it up. Then prune the roots, now erected in the air, from the bruifes and wounds they received in being dug up, and anoint the pruned parts with a compofition of two ounces of turpentine, four ounces of tallow, and four ounces of bees wax melted together and applied pretty warm. Afterwards prune off all the buds or fhoots that are upon the ftem, and drefs the wounds with the fame compofition, to prevent any collateral fhootings, that might fpoil the beauty of the ftem.

PLANTING, in architecture, the laying the firft courfe of ftones, in the foundations of buildings. See FOUNDATION.

PLASENDAL, a fortrefs of Flanders, three miles fouth-eaft of Oftend.

PLASHING *of quickfet-hedges*, an operation very neceffary to promote the growth and continuance of old hedges. See the article HEDGE.

It is performed in this manner: the old ftubs muft be cut off, *&c.* within two or three inches of the ground, and the beft and longeft of the middle fized fhoots muft be left to lay down. Some of the ftrongeft of thefe muft alfo be left to anfwer the purpofe of ftakes. Thefe are to be cut off to the height at which the hedge is intended to be left; and they are to ftand at ten foot diftance one from another: when there are not proper fhoots for thefe at the due diftances, their places muft be fupplied with common ftakes of dead wood. The hedges is to be firft thinned, by cutting away all but thofe fhoots which are intended to be ufed either as ftakes, or the other work of the plafhing; the ditch is to be cleaned out with the fpade: and it muft be now dug as at firft, with floping fides each way; and when there is any cavity on the bank on which the hedge grows, or the earth has been wafhed away from the roots of the fhrubs, it is to be made good by facing it, as they exprefs it, with the mould dug from the upper part of the ditch: all the reft of the earth dug out of the ditch is to be laid upon the top of the bank, and the owner fhould look carefully into it that this be done; for the workmen, to fpare themfelves trouble, are apt to throw as much as they can upon the face of the bank; which being by this means overloaded, is foon wafhed off into the ditch again, and a very great part of the work undone; whereas what is laid on the top of the bank always remains there, and makes a good fence of an indifferent hedge.

In the plafhing the quick, two extremes are to be avoided; thefe are, the laying it too low, and the laying it too thick; this makes the fap run all into the fhoots, and leaves the plafhes without fufficient nourifhment; which, with the thicknefs of the hedge, finally kills them. The other extreme of laying them too high, is equally to be avoided; for this carries up all the nourifhment into the plafhes, and fo makes the fhoots fmall and weak at the bottom, and, confequently, the hedge thin. This is a common error in the north of England. The beft hedges made any where in England, are thofe in Hertfordfhire; for they are plafhed in a middle way between the two extremes, and the cattle are by that prevented both from croping the young fhoots, and from going through; and a new and vigorous hedge foon forms itfelf. When the fhoot is bent down that is intended to be plafhed, it muft be cut half way through with the bill: the cut muft be given floping, fomewhat downwards, and then it is to be wounded about the ftakes, and after this its fuperfluous branches are to be cut off, as they ftand out at the fides of the hedge. If for the firft year or two the field where a new hedge is made can be ploughed, it will thrive the better for it; but if the ftubs are very old, it is beft to cut them quite down, and to fecure them with good dead hedges on both fides, till the fhoots are grown up from them ftrong enough to plafh; and wherever void fpaces are feen, new fets are to be planted to fill them up. A new hedge raifed from fets in the common way, generally requires plafhing about eight or nine years after.

PLASTER, *emplaftrum*, in pharmacy, is defined to be an external application, of a harder confiftence than our ointments: thefe are to be fpread according to the different circumftances of the wound, place, or patient, either upon linen or leather. If the part upon which they are to be laid be naturally hairy, it muft be fhaved; but that they may ftick the better, the natural fhape of the part muft be confulted, and the plafter fpread and formed accordingly, either round, fquare, triangular, elliptical, in a lunar form, or in fhape of the letter

letter T. Some alſo are divided at both ends, and others are perforated in the middle; theſe laſt are of frequent uſe in fractures attended with a wound; for by this contrivance the wound may be cleanſed and dreſſed without removing the plaſter. Theſe plaſters are of different forms, according to the part they are laid on; but they are uſually ſquare, or round; and indeed there is almoſt no part of the body which a plaſter of one of thoſe forms may not be made to ſerve for, if it be notched about the edges with a pair of ſciſſars. See plate CCII. fig. 2.

The uſes of plaſters are various; they are ſerviceable in ſecuring the dreſſings, they alſo forward the maturation of the pus, agglutinate and heal wounds, unite broken bones, heal burns, aſſuage pain, and ſtrengthen weak parts.

The common plaſter is made by boiling one gallon of oil-olive, with five pounds of litharge finely powdered, in about a quart of water, over a gentle fire, and continually ſtirring them, till the oil and litharge are united, and the whole acquires the conſiſtence of a plaſter.

The quickſilver plaſter is made thus: Take of the common plaſter one pound, of quickſilver three ounces, and of the ſimple balſam of ſulphur a dram; and, laſtly, let them be incorporated.

A cephalic is ordered by the college to be made out of two pounds of burgundy pitch, one pound of ſoft labdanum, and yellow roſin and yellow wax, of each four ounces; one ounce of what is called the expreſſed oil of mace: the pitch, roſin, and wax being firſt melted together, add firſt the labdanum, and then the oil of mace.

A ſtrengthening plaſter is made, by adding to two pounds of the common plaſter melted, half a pound of frankincenſe, and three ounces of dragon's blood, both reduced to powder.

A drawing plaſter is made thus: Take yellow roſin and yellow wax, of each three pounds; of tried mutton-ſuet one pound; melt all together, and ſtrain the mixture for uſe.

The bliſtering plaſter is made thus: Take of the drawing plaſter two pounds, of cantharides one pound, of vinegar half a pint; the plaſter being melted, a little before it hardens, ſprinkle in the cantharides, reduced to a very fine powder; then add the vinegar, and beat all well together.

There are ſeveral other forms of plaſters, for which we muſt refer the reader to the diſpenſatories.

Plaster, among builders, *&c.* The plaſter of paris is a preparation of ſeveral ſpecies of gypſums, dug near Mont Maitre, a village in the neighbourhood of Paris; whence the name. See the article Gypsum.

The beſt ſort is hard, white, ſhining, and marbly; known by the names of plaſter-ſtone, or parget of Mount Maitre. It will neither give fire with ſteel, nor ferment with aqua fortis, but very freely and readily calcines in the fire, into a very fine plaſter; the uſe of which in building, and caſting ſtatues, is well known. See the article Stucco.

As the modern taſte runs greatly into plaſtering, it were to be wiſhed that this art could be brought to its antient perfection. The plaſters of the Romans were exceeding durable; witneſs ſeveral yards of it ſtill to be found on the top of the pont de Garde, near Niſmes. At Venice they uſe a very durable plaſter; but as the ſecret of preparing it, is not known among us, it would be worth while to try whether ſuch a ſubſtance might not be made by boiling the powder of gypſum dry over the fire, for it will boil in the manner of water; and when this boiling or recalcining was over, the mixing with it reſin, or pitch, or both together, with common ſulphur, and the powder of ſea-ſhells. If theſe were all mixed together, and the water added to it hot, and the matter all kept hot upon the fire till the inſtant of its being uſed, ſo that it might be laid on hot, it is poſſible this ſecret might be hit upon. Wax and oil of turpentine may be alſo tried as additions: theſe being the common ingredients in ſuch cements as we have accounts of are the firmeſt. Strong ale-wort is by ſome directed to be uſed, inſtead of water, to make mortar of lime-ſtone be of a more than ordinary ſtrength. It is poſſible, that the uſe of this tenacious liquor in the powdered ingredients of this propoſed plaſter, might greatly add to their ſolidity and firmneſs.

PLASTIC, πλαςικ☉-, denotes a thing endued with a formative power, or a faculty of forming or faſhioning a maſs of matter, after the likeneſs of a living being; ſuch a virtue as ſome of the antient epicureans, and perhaps the peripatetics too, imagined to reſide in the earth, or, at leaſt, to have antiently reſided therein, by means whereof, and without any extraordinary

traordinary intervention of a creator, it put forth plants, &c. Some of them feem to be of opinion, that animals and even man himfelf, was the effect of this plaftic power.

PLASTICE, the PLASTIC ART, a branch of fculpture, being the art of forming figures of men, birds, beafts, fifhes, &c. in plafter, clay, ftuc, or the like. See the article SCULPTURE.

Plaftice differs from carving, in that here the figures are made by the addition of what is wanting; but in carving always by fubtracting what is fuperfluous. The plaftic art is now chiefly ufed among us, in fret-work ceilings; but the Italians apply it alfo to the mantlings of chimnies with great figures.

PLAT-VEINS, in the manege, the veins wherein we bleed horfes, one in the lower part of each fhoulder, and the other in the flat part of the thighs.

PLATS of a fhip, flat ropes made of rope yarn, and weaved one over the other; they ferve to fave the cable from galling in the hawfe, or to wind about the flukes of the anchors, to fave the pennant of the forefheet from galling againft them.

PLATA, a fmall ifland in the pacific ocean, near the coaft of Peru, fituated weft long. 81°, fouth lat. 1°. It is alfo the name of a city of Peru, capital of the province of La Plata, fituated in weft long. 66° 30′, fouth lat. 22° 30′: and alfo the name of a great river of Peru, which rifing in the province of La Plata, and running fouth-eaft till it joins the river Paragua, difcharges itfelf into the atlantic ocean, below the city of Buenos Ayres.

PLATANUS, the PLANE TREE, in botany. See the article PLANE TREE.

PLATBAND, in gardening, a border or bed of flowers along a wall, or the fide of a parterre frequently edged with box, &c. In architecture platband is any flat fquare-moulding, whofe height much exceeds its projecture; fuch are the faces or fafciæ of an architrave, and the platbands of the modillions of a corniche.

PLATBAND of a door or window is ufed for the lintel, where that is made fquare, or not much arched; thefe platbands are ufually croffed with bars of iron when they have a great bearing, but it is much better to eafe them by arches of difcharge built over them.

PLATBANDS of flutings, are the lifts or fillets between the flutings of columns.

PLATE, in commerce, fignifies gold or filver wrought into veffels, for domeftic ufes.

Plate on being imported pays the following duties, *viz.* filver plate of France on importation pays 3s. $2\frac{49}{100}$d. the ounce; and, on exportation, draws back, 2s. $1\frac{35}{100}$d. Plate of the Eaft Indies, pays on importation, 2s. $2\frac{49}{100}$d. the ounce; and, on exportation, draws back, 2s. $1\frac{35}{100}$d. Of all other places, pays on importation, 1s. $5\frac{49}{100}$d. the ounce; and, on exportation, draws back, 1s. $4\frac{35}{100}$d. Silver gilt pays on importation, the ounce, of France, 3s. $10\frac{61\frac{1}{4}}{100}$d. and on exportation, draws back, 2s. $6\frac{18\frac{3}{4}}{100}$d. Of the Eaft Indies, pays on importation, 2s. $7\frac{61\frac{1}{4}}{100}$d. and on exportation, draws back, 2s. $6\frac{18\frac{3}{4}}{100}$d. Of all other places pays on importation, 1s. $8\frac{36\frac{1}{4}}{100}$d. and on exportation, draws back, 1s. $6\frac{93\frac{3}{4}}{100}$d. Gold-plate wrought, pays on importation, the ounce, 19s. $1\frac{80}{100}$d. and, on exportation, draws back, 17s. 3d.

PLATE, in heraldry, is a round flat piece of filver, without any impreffion; but as it were formed, ready to receive it.

PLATE is alfo a term ufed by our fportfmen, to exprefs the reward given to the beft horfe at our races. See RACE.

PLATES, in gunnery. The prife plates are two plates of iron on the cheeks of a gun-carriage, from the cape-fquare to the center, through which the prife bolts go, and on which the handfpike refts when it poifes up the breech of the piece. Breaft plates are the two plates on the face of the carriage, one on each cheek. Train-plates are the two plates on the cheeks, at the train of the carriage. Dulidge-plates are the fix plates on the wheel of a gun-carriage, where the fellows are joined together, and ferve to ftrengthen the dulidges.

PLATE-LONGE, in the manege, a woven ftrap, four fathom long, three fingers broad, and one thick; ufed for raifing the legs of a horfe, and fometimes for taking him down, in order to facilitate feveral operations of the farrier.

PLATEA, the SPOONBILL, in ornithology, a fpecies of anas, with a flat beak, broad and rounded at the end, fo as to refemble

resemble, in some degree, a spoon, whence the name. See plate CC. fig. 7.

It is of the shape, and about the size of our common heron. See the articles ANAS and HERON.

PLATFORM, in the military art, an elevation of earth, on which cannon is placed, to fire on the enemy; such are the mounts in the middle of curtins. On the rampart there is always a platform, where the cannon are mounted. It is made by the heaping up of earth on the rampart, or by an arrangement of madriers, rising insensibly, for the cannon to roll on, either in a casemate, or on attack in the outworks.

All practitioners are agreed, that no shot can be depended on, unless the piece can be placed on a solid platform; for if the platform shakes with the first impulse of the powder, the piece must likewise shake, which will alter its direction, and render the shot uncertain.

PLATFORM, in architecture, is a row of beams, which support the timber-work of a roof, and lie on the top of the wall, where the entablature ought to be raised. This term is also used for a kind of terrace, or broad, smooth, open walk at the top of a building, from whence a fair prospect may be taken of the adjacent country. Hence an edifice is said to be covered with a platform, when it is flat at top, and has no ridge. Most of the oriental buildings are thus covered, as were all those of the antients.

PLATFORM, or ORLOP, in a man of war, a place on the lower deck, abaft the main-mast, between it and the cockpit, and round about the main capstan, where provision is made for the wounded men in time of action.

PLATIASMOS, a word used to express a fault in pronunciation, owing to a person's opening his mouth too wide, and then speaking indistinctly.

PLATONIC, something that relates to Plato, his school-philosophy, opinions, or the like; thus, platonic love denotes a pure spiritual affection, for which Plato was a great advocate, subsisting between the different sexes, abstracted from all carnal appetites, and regarding no other object but the mind and its beauties: or it is even a sincere disinterested friendship subsisting between persons of the same sex, abstracted from any selfish views, and regarding no other object than the person, if any such love or friendship has aught of a foundation in nature.

PLATONIC YEAR, or the GREAT YEAR, is a period of time determined by the revolution of the equinoxes, or the space wherein the stars and constellations return to their former places, in respect of the equinoxes. The platonic year, according to Tycho Brahe, is 25816; according to Ricciolus 25920, and according to Cassini 24800 years. See PRECESSION. This period once accomplished, it was an opinion among the antients, that the world was to begin anew, and the same series of things to turn over again.

PLATONISM, the doctrine and sentiments of Plato and his followers, with regard to philosophy, &c.

In physics, Plato followed Heraclitus; in ethics and politics, Socrates; and in metaphysics, he followed Pythagoras; and his disciples were called academics. See the articles ACADEMIC, &c.

The platonic philosophy is thought very consistent with the mosaic; and a great many of the primitive fathers follow the opinions of that philosopher, as being favourable to christianity. Justin is of opinion that Plato could not learn many things which he has said in his works from mere natural reason, but thinks he might have learned them from the books of Moses, which he might have read when in Egypt.

PLATTOON, or PLOTTOON, in the military art, a small square body of forty or fifty men, drawn out of a battalion of foot, and placed between the squadrons of horse, to sustain them; or in ambuscades, straits, and defiles, where there is not room for whole battalions or regiments. Plattoons are also used when they form the hollow-square, to strengthen the angles. The grenadiers are generally posted in plattoons.

PLATYSMA MYOIDES, in anatomy, a name given by Fallopius to one of the muscles, called latissima colli, by some quadratus genæ, and subcutaneus by others. See SUBCUTANEUS.

PLAUSUS, among the Romans. See the article ACCLAMATION.

PLAY, *lusus*. See GAME and GAMING.

PLAY, in poetry. See the articles DRAMA, TRAGEDY, COMEDY, &c.

PLAY-HOUSE. See the articles THEATRE, AMPHITHEATRE, &c.

PLEA, in law, is what either party alledges for himself in court, in a cause there depending; and, in a more restrained sense, it is the defendant's answer to the plaintiff's declaration.

Pleas are ufually divided into thofe of the crown and common pleas. Pleas of the crown are all fuits in the king's name, or in the name of the attorney-general on his behalf, for offences committed againft his crown and dignity, and againft his peace; as treafon, murder, felony, *&c.* Common pleas are fuch fuits as are carried on between common perfons, in civil cafes. Thefe pleas may be divided into as many branches as there are actions. To an action there is either a general or a fpecial plea: and here, a general plea is a general anfwer to the declaration, as in a debt or contract; the general plea is, that he owes nothing; in a debt upon bond, that it is not his deed, or he paid it on the day; in an action on a promife, that he made no promife; and in a trefpafs, not guilty. Special pleas are either in bar to the action brought, or in abatement of the writ on which the action is framed. All pleas are to be fuccinct, without any unneceffary repetitions, and muft be direct and pertinent to the cafe.

Court of common PLEAS. See the article COMMON PLEAS.

PLEADING, in law, a fpeech uttered at the bar, in defence of a caufe: but, in a ftricter fenfe, pleadings are all the allegations of the parties to a fuit, made after the declaration, till the iffue is joined. In this fenfe they exprefs what is contained in the bar, replication, and rejoinder; and not what is in the declaration itfelf. Hence defaults in the matter of declaration are not confined within the mifpleading.

From the conqueft all pleading was performed in french, till the reign of Edward III. when it was appointed that the pleas fhould be pleaded in englifh; but that they fhould be entered or recorded in latin. At Athens, and even in France and England, formal and prepared pleadings were prohibited, and it was unlawful to amufe the court with long artful harangues; only it was the fettled cuftom here, in important matters, to begin the pleadings with a text out of the holy fcriptures. It is but of late years that eloquence was admitted to the bar.

PLEASURE and pain, fays Mr. Locke, are fimple ideas, which we receive both from fenfation and reflection; there being thoughts of the mind, as well as fenfations, accompanied with pleafure or pain. See the article PAIN.

There are a great many modes of pleafure and pain, which refult from the various confiderations of good and evil, whether natural or moral, and the paffions thereby excited. See the articles GOOD, EVIL, and PASSIONS.

Pleafure and pain feem to be the means made ufe of, by nature, to direct us in the purfuit of happinefs; fince pleafure is annexed to whatever contributes thereto, and pain is the companion of what tends to our ruin. Hence it is, that the pleafures of a child, a youth, a grown perfon, and an old man, all vary, according to the different things required by nature in each ftate, whether fimply for the prefervation of the individual, or for that and propagation jointly.

PLEBEIAN, *plebeius*, any perfon of the rank of the common people. It is chiefly ufed in fpeaking of the antient Romans, who were divided into fenators, knights, and plebeians or commons.

PLEBISCITUM, in roman antiquity, a law enacted by the common people, at the requeft of the tribune, or other plebeian magiftrate, without the intervention of the fenate; but more particularly denotes the law which the people made, when they retired to the Aventine mount.

PLECTRONITÆ, in natural hiftory, the fame with the conicthyodontes. See the article CONICTHYODONTES.

PLEDGE, *plegius*, in common law, a furety, either real or perfonal, which the plaintiff is to find, for profecuting the fuit. See the article SURETY.

PLEDGERY, or PLEGGERY, furetifhip, or an anfwering for another perfon.

PLEDGET, BOLSTER, or COMPRESS, *plumaceolus*, in furgery, a kind of flat tent, laid over a wound, to imbibe the fuperfluous humours, and keep it clean. See the article WOUND.

PLEGIIS ACQUIETANDIS, in law, a writ that lies for a furety, in cafe he pay not the money at the day.

PLEIADES, *vergiliæ*, in aftronomy, an affemblage of ftars in the neck of the conftellation taurus. See TAURUS.

PLENARTY, in law, is when a churchbenefice is full of an incumbent. See the article INCUMBENT.

Inftitution is held to be a good plenarty againft a common perfon, but not againft the king, without induction. See the article INSTITUTION and INDUCTION.

PLENARY, fome thing complete or full.

PLENILUNIUM, in aſtronomy, that phaſis of the moon commonly called the full moon. See the article MOON.

PLENIPOTENTIARY, a perſon veſted with full power to do any thing. See the article EMBASSADOR.

The term plenipotentiary is chiefly applied to ſuch miniſters of princes or ſtates as are ſent to treat of peace, *&c.*

PLENITUDE, *plenitudo*, the quality of a thing that is full, or that fills another. In medicine, it chiefly denotes a redundancy of blood and humours. See the article PLETHORA.

PLENUM, in phyſics, denotes, according to the carteſians, that ſtate of things, wherein every part of ſpace is ſuppoſed to be full of matter; in oppoſition to a vacuum. See the article VACUUM.

PLEONASM, *pleonaſmus, redundantia*, a figure in rhetoric, whereby we uſe words ſeemingly ſuperfluous, in order to expreſs a thought with the greater energy: ſuch as, I ſaw it with my own eyes, *&c.*

This grammarians uſually reckon a fault in diſcourſe.

PLEROTICS, *plerotica*, in medicine, a kind of remedies that are healing, or that fill up the fleſh: otherwiſe called incarnatives and ſarcotics. See the article SARCOTICS.

PLESKOW, a city of Ruſſia, ſituated at the ſouth end of the lake Worſero: eaſt. long. 28° 30′, and north lat. 57° 20′.

PLESSE, a town of Sileſia, ſituated on the river Viſtula, thirty-five miles eaſt of Troppaw.

PLETHORA, in medicine, a greater redundance of laudable blood and humours than is capable of undergoing thoſe changes which muſt neceſſarily happen for the purpoſes of life, without inducing diſeaſes.

A plethora is cured by veneſection, exerciſe, watchings, a ſharp and acrid diet, after due evacuations, and by a gradual omiſſion of theſe evacuations.

PLETHORIC, *plethoricus*, a perſon abounding with blood, or labouring under a plethora.

PLEVIN, *plevina*, in law, the ſame with pledge. See the article PLEDGE.

PLEURA, in anatomy, a ſmooth, robuſt, and tenſe membrane, adhering to the ribs and to the intercoſtal muſcles, and ſurrounding the whole cavity of the thorax. Its ſtructure reſembles two ſacks, one of which ſurrounds one ſide of the thorax, and the other the other ſide, and each of them contains one of the two lobes of the lungs: from the conjunction of theſe two ſacculi of the pleura, in the middle of the thorax, is formed the mediaſtinum. See MEDIASTINUM.

The pleura is compoſed of a double membrane of a very muſculous ſtructure. Its veſſels are arteries, veins, nerves, and lymphatics. The arteries ariſe from the intercoſtals, the diaphragmatic, and the mammary ones, and are very numerous; the veins, from the veins of the ſame name with thoſe arteries; but all of them diſcharge themſelves into the trunk of the vena azygos, and the upper trunk of the cava. The nerves are from the vertebræ of the thorax and the diaphragmatic ones. The lymphatics all run to the ductus thoracicus.

The uſe of the pleura is to lubricate and ſtrengthen the whole cavity of the thorax.

PLEURISY, πλευρῖτις, in medicine, a violent pain in the ſide, attended with an acute fever, a cough, and a difficulty of breathing.

This diſorder affects all the parts of the internal integuments of the thorax, the whole of the pleura, and the whole of the mediaſtinum; and therefore, when it is ſeated in the membrane internally lining the ribs, it is called a true or internal pleuriſy; but when it chiefly occupies the external parts, and only the intercoſtal muſcles, and thoſe above them, are affected, it is called a ſpurious or baſtard-pleuriſy.

The pleuriſy is moſt predominant between the ſpring and ſummer. It begins with chilneſs and ſhivering, which are ſoon ſucceeded by heat, thirſt, inquietude, and the other common ſymptoms of a fever. After a few hours the patient is ſeized with a violent pricking pain in one of his ſides, about the ribs, which ſometimes extends itſelf towards the ſhoulder-blades, ſometimes towards the back-bone, and ſometimes towards the fore-parts of the breaſt, and this is attended with frequent coughing. The matter which the patient ſpits, is at firſt little and thin, and mixed with particles of blood; but as the diſeaſe advances, it is more plentiful and more concocted, but not without a mixture of blood. The pulſe is remarkably ſtrong, and ſeems to vibrate like a tenſe ſtring of a muſical inſtrument; and the blood drawn from a vein, as ſoon as it is cold, looks like melted ſuet. As to the ſpitting, it is frequently abſent, and hence pleuriſies are diſtinguiſhed into moiſt and dry.

As in all inflammatory fevers, fo in this, too hot a regimen is to be fhunned, both with refpect to the bed-cloaths and the heat of the room; nor muft the patient be expofed to the cold air, nor drink things actually cold. Hoffman obferves that all ftrong fudorifics and cathartics are hurtful; and that if the patient has three or four ftools, the courfe of nature muft not be ftopped. The diet fhould be cooling, relaxing, flender, and diluting. Moiftening things taken warm, are preferable to all others; and hence barley or oatmeal-gruel, fweetened with honey, and alfo fweet whey, are proper. If the phyfician is called before the third day, Boerhaave directs a large quantity of blood to be let, from a wide orifice in a large veffel, and to fetch deep fighs, or cough, to promote its celerity; and the part affected fhould be rubbed gently at the fame time, and the bleeding continued till the pain remits, or the patient is ready to faint. This fhould be repeated as often as the fymptoms return, which it was intended to remove, and till the abfence of the white inflammatory pellicle from the furface of the blood when cold, fhews it is time to leave it off. This Huxham confirms by his own experience, and adds, that after the fourth day, bleeding is not fafe; he likewife recommends fomenting the part, which often eafes the pain, and terminates the difeafe: but if it is obftinate, he recommends flight fcarifications, then cupping, and afterwards a blifter on the fame place; which has been fuccefsful, when the ufual methods failed. The patient's body fhould be kept open, for which purpofe emollient clyfters are proper; and he fhould, at the fame time, take large quantities of ftrong, diluting, aperient, and antifeptic liquors: for this purpofe, take the leaves of fcordium, jack-by-the-hedge, and white horehound, each two ounces; boil them in two points of water, with which mix of the oxymel of fquills, eight ounces; of nitre, three drams; and of treacle-vinegar, one ounce: of this mixture let the patient, every quarter of an hour, take two ounces, as warm as poffible.

Dr. Mead obferves, on the treatment of this diforder, that after drawing as much blood as is neceffary, draughts with frefh-drawn linfeed-oil, are of great fervice for eafing the cough; nitre, for allaying the heat; and for diffolving the fizy blood that obftructs the fmall canals, wild goat's blood and volatile falts; and, laftly, a blifter laid on the part affected, in order to draw forth the peccant humour.

A purulent abfcefs or empyema is fometimes formed in this difeafe, for the treatment of which, fee EMPYEMA.

As to the baftard-pleurify, Hoffman fays that it is properly a kind of rheumatifm, and does not require bleeding, unlefs the patient is plethoric, but a diaphorefis and a more free perfpiration. Lancifi, however, advifes plentiful bleeding in the arm, fcarifying the part affected, and cupping: and during the cure, it is neceffary to keep the body open, and the bowels free from fpafms; for which purpofes, emollient clyfters are proper, with oil of fweet almonds.

PLEURONECTES, in ichthyology, a genus of malacopterygious fifhes, the eyes of which are both placed on one fide of the head, and this is fometimes the right and fometimes the left; the branchioftege membrane contains on each fide fix fmall bones.

To this genus belong the plaife, flounder, and turbot, which have both the eyes on the right fide; and the pearl and foal, which have both the eyes on the left fide.

PLEUROPNEUMONY, in medicine, a difeafe partaking of the nature both of a pleurify and peripneumony. See the articles PLEURISY and PERIPNEUMONY.

PLEXUS, among anatomifts, a bundle of fmall veffels interwoven in the form of net-work: thus a congeries of veffels within the brain is called plexus choroides, reticularis, or retiformis. See the article *Plexus* CHOROIDES.

A plexus of nerves is an union of two or more nerves, forming a fort of ganglion or knot.

PLICA POLONICA, in medicine, a difeafe of the hair, almoft peculiar to Poland and Lithuania, and hence denominated polonica. It confifts of a preternatural bulk of the hair, which being firmly conglutinated and wrapped up in inextricable knots, and extended to a monftrous length, affords a very unfeemly fpectacle. When thefe are cut off, the blood is difcharged from them, the head racked with pain, the fight impaired, and the patient's life frequently endangered.

This diforder is fuppofed to arife from the fordid and nafty manner of life to which thefe people are addicted, and from an hereditary fault conveyed from the parents,

rents, which confifts in too great a bulk of the pores and bulbous hairs under the fkin of the head: hence the thick and glutinous nutritious juice, produced by their coarfe aliments and impure waters, is by heat forced into the cavities of the hairs, and fweating through their pores, produces this terrible difeafe.

A perfect method of curing this diforder is unknown; undoubtedly becaufe in thofe parts of Poland, in which this difeafe is endemial, there have been few phyficians, who, from what is commonly known of the nature and cure of the plica polonica, have been able to lay down a rational and judicious plan for treating it. It is certain, that purging and venefection are fo far from being beneficial in this diforder, that they often prove hurtful, by throwing the peccant humours into violent commotions, and more effectually diftributing them through the whole body. It is therefore moft fafe and expedient to folicit the peccant matter to the hairs, to which it naturally tends: and this intention, Sennertus fays, is moft effectually anfwered by lotions prepared of bear's breech.

PLICATED, fomething folded together, one part over another; as the leaves of certain plants, &c.

PLIMOUTH, a port-town of Devonfhire, and a ftation for the building and laying up of fhips of war belonging to the royal navy: weft long. 4° 27′, north lat. 50° 26′.

It fends two members to parliament.

PLIMOUTH is alfo a port-town of New-England, and the capital of a county of the fame name: weft long. 71°, north lat. 41° 25′.

PLIMTON, a borough-town of Devonfhire, fituated near the englifh Channel, thirty fix miles fouth-weft of Exeter.

It fends two members to parliament.

PLINIA, in botany, a genus of the polyandria-monogynia clafs of plants, the flower of which confifts of a fingle petal, divided into five hollow oval fegments: the fruit is a large, globofe, and unilocular berry; containing a fingle, very large globofe and fmooth feed.

PLINTH, ORLE, or ORLO, in architecture, a flat fquare member, in the form of a brick.

It is ufed as the foundation of columns, being that flat fquare table, under the moulding of the bafe and pedeftal at the bottom of the whole order. It feems to have been originally intended to keep the bottom of the original wooden pillars from rotting.

Vitruvius alfo calls the tufcan abacus, plinth.

PLINTH *of a ftatue*, &c. is a bafe, either flat, round, or fquare, that ferves to fupport it.

PLINTH *of a wall*, denotes two or three rows of bricks advancing out from a wall; or, in general, any flat high moulding, that ferves in a front wall to mark the floors, to fuftain the eaves of a wall, or the larmier of a chimney.

PLOCE, a figure in rhetoric, whereby a word is repeated by way of emphafis, fo as not only to exprefs the fubject, but the quality thereof; *e. gr. His wife is a wife indeed!*

PLOCSKOW, the capital of a palatinate of the fame name, in Poland, fifty miles north-weft of Warfaw.

PLOEN, a city of Holftein, in Germany, twenty-four miles north-weft of Lubec: eaft long. 10°, north lat. 54° 40′.

PLOT, in dramatic poetry, is fometimes ufed for the fable of a tragedy or comedy, but more particularly the knot or intrigue, which makes the embarras of any piece. The unravelling puts an end to the plot.

PLOT, in furveying, the plan or draught of any field, farm, or manor furveyed with an inftrument, and laid down in the proper figure and dimenfions.

PLOTTING, among furveyors, is the art of laying down on paper, &c. the feveral angles and lines of a tract of ground furveyed by a theodolite, &c. and a chain.

In furveying with the plain-table, the plotting is faved; the feveral angles and diftances being laid down on the fpot, as faft as they are taken. See the article PLAIN-TABLE.

But, in working with the theodolite, femicircle, or circumferentor, the angles are taken in degrees; and the diftances in chains and links; fo that there remains an after-operation to reduce thefe members into lines, and fo to form a draught, plan, or map; this operation is called plotting.

Plotting then is performed by means of two inftruments, the protractor and plotting-fcale. By the firft, the feveral angles obferved in the field with a theodolite, or the like, and entered down in degrees in the field-book, are protracted on paper in their juft quantity.

By

By the latter, the feveral diftances meafured with the chain, and entered down in like manner in the field-book, are laid down in their juft proportion.

Under the articles protractor and plotting-fcale, are found feverally the ufe of their refpective inftruments in the laying down of angles and diftances: we fhall here give their ufe conjointly in the plotting of a field, furveyed either with the circumferentor or theodolite.

Method of Plotting *from the circumferentor.* Suppofe an enclofure, *e. gr.* A B C D E F G H K (plate CCV. fig. 1.) to have been furveyed; and the feveral angles, as taken by a circumferentor, in going round the field, and the diftances as meafured by a chain, to be found entered in the field-book, as in the following table:

	Deg.	Min.	Cha.	Links.
A	191	00	10	75
B	297	00	6	83
C	216	30	7	82
D	325	00	6	96
E	12	24	9	71
F	324	30	7	54
G	98	30	7	54
H	71	00	7	78
K	161	30	8	22

On a paper of the proper dimenfions, as LMNO (*ibid.*) draw a number of parallel and equidiftant lines. Their ufe is to direct the pofition of the protractor; the diameter whereof muft always be laid either upon one of them or parallel thereto; the femi-circular limb downwards for angles greater than 180°, and upwards, for thofe lefs than 180°.

The paper being thus prepared, affume a point on fome meridian, as A, whereon lay the center of the protractor, and the diameter along the line. Confult the field-book for the firft angle, *i. e.* for the degrees cut by the needle at A, which the table gives you 191°.

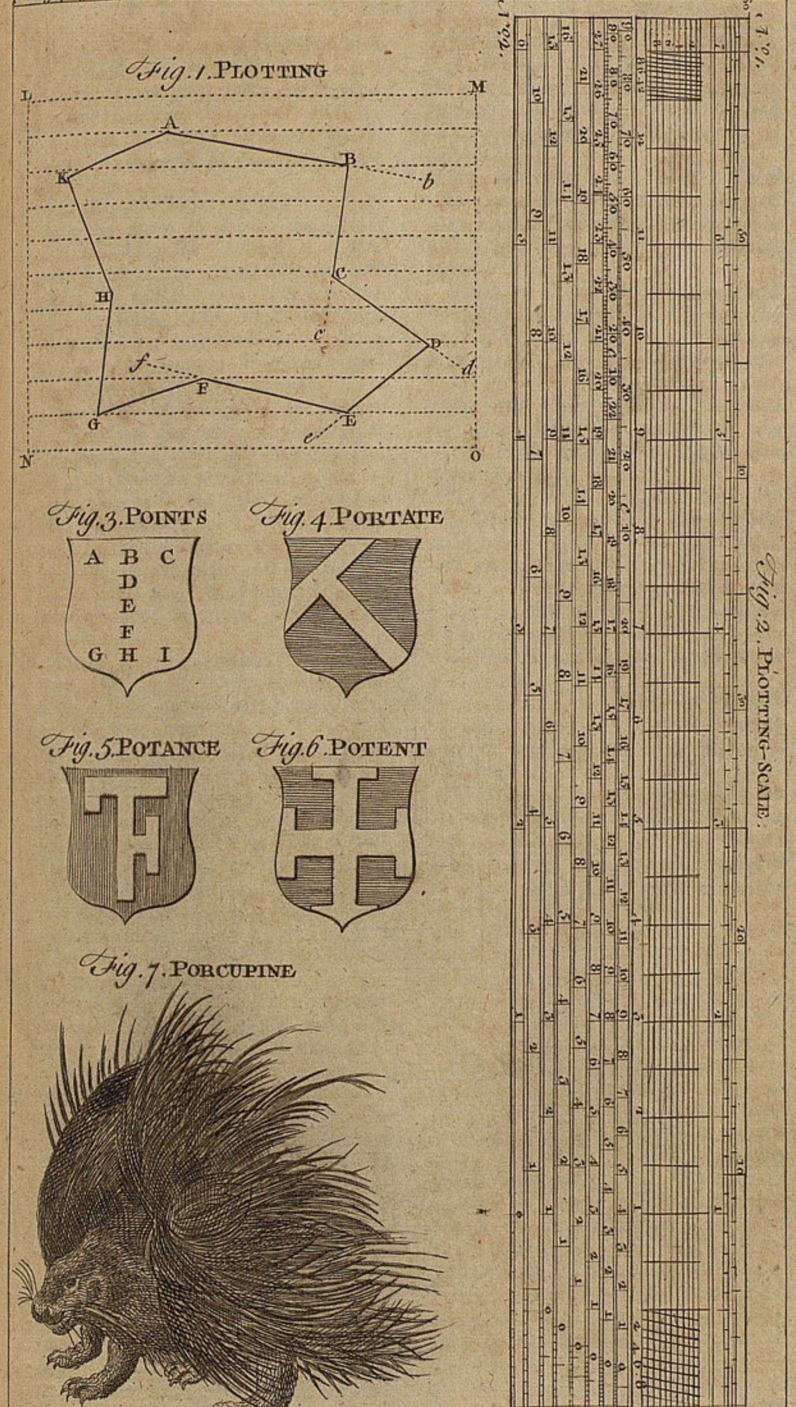
Now fince 191° is more than a femicircle, or 180, the femi-circle of the protractor is to be laid downwards; where keeping it to the point with the protracting-pin, make a mark againft 191; through which mark, from A, draw an indefinite line A *b*. The firft angle thus protracted, again confult the book, for the length of the firft line A B; thus you find 10 chains 75 links. From a convenient fcale, therefore, on the plotting-fcale, take the extent of 10 chains 75 links between the compaffes; and, fetting one point in A, mark where the other falls in the line A *b*, which fuppofe in B: draw therefore the full line A B, for the firft fide of the inclofure.

Proceed then to the fecond angle, and laying the center of the protractor on the point B, with the diameter as before directed, make a mark, as *c*, againft 297°, the degrees cut at B; and draw the indefinite line B *c*. On this line from the plotting-fcale, as before, fet off the length of your fecond line, *viz.* 6 chains 83 links; which extending from B to the point C, draw the line B C for the fecond fide. Proceeding now to the third angle or ftation, lay the center of the protractor, as before, on the point C; make a mark, as *d*, againft the number of degrees cut at C; *viz.* 216° 30′; draw the indefinite line C *d*, and thereon fet off the third diftance, *viz.* 7 chains 82 links; which terminating, *e. gr.* at D, draw the full line C D for the third fide.

Proceed now to the fourth angle D; and, laying the center of the protractor over the point D, againft 325°, the degree cut by the needle, make a mark *e*; draw the dry line D *e*, and thereon fet off the diftance 6 chains 96 links, which terminating in E, draw D E for the fourth line, and proceed to the fifth angle, *viz.* E.

Here the degrees cut by the needle being 12° 24′ (which is lefs than a femi-circle) the center of the protractor muft be laid on the point E, and the diameter on the meridian, with the femi-diameter limb turned upwards. In this fituation make a mark, as before, againft the number of degrees, *viz.* 12° 24′, cut by the needle at E; draw the dry line E *f*, on which fet off the fifth diftance, *viz.* 9 chains 71 links, which extending from E to F, draw the full line E F, for the fifth fide of the inclofure. After the fame manner proceed orderly to the angles F, G, H, and K; then placing the protractor, making marks againft the refpective degrees, drawing indefinite dry lines, and fetting off the refpective diftances as above, you will have the plot of the whole inclofure A B C, *&c.*

Such is the general method of plotting from this inftrument; but it muft be obferved, that in this procefs the ftationary lines, *i. e.* the lines wherein the circumferentor is placed to take the angles, and wherein the chain is run to meafure the diftances, are properly the lines here plotted. When, therefore, in furveying, the ftationary lines are at any diftance



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diſtance from the fence or boundaries of the field, *&c.* off-ſets are taken, *i. e.* the diſtance of the fence from the ſtationary line is meaſured at each ſtation; and even at intermediate places, if there prove any conſiderable bends in the fence.

In plotting, therefore, the ſtationary lines being laid down as above, the off-ſets muſt be laid down from them, *i. e.* perpendiculars of the proper lengths muſt be let fall at the proper places from the ſtationary lines. The extremes of which perpendiculars, being connected by lines, give the plot deſired. If inſtead of going round the field the angle and diſtances have been all taken from one ſtation, the proceſs of plotting is obvious, from the example above: all here required being to protract, after the manner already deſcribed, the ſeveral angles and diſtances taken from the ſame ſtationary point in the field, from the ſame point or center of the paper. The extremities of the lines thus determined, being then connected by lines, will give the plot required.

Plotting-scale, a mathematical inſtrument, uſually of wood, ſometimes of braſs, or other matter; and either a foot, or half a foot long.

On one ſide of the inſtrument (plate CCV. fig. 2. n° 2.) are ſeven ſeveral ſcales, or lines, divided into equal parts. The firſt diviſion of the firſt ſcale is ſubdivided into ten equal parts, to which is prefixed the number 10, ſignifying that ten of thoſe ſubdiviſions make an inch; or that the diviſions of that ſcale are decimals of inches.

The firſt diviſion of the ſecond ſcale is likewiſe ſubdivided into 10, to which is prefixed the number 16, denoting that ſixteen of theſe ſubdiviſions make an inch. The firſt diviſion of the third ſcale is ſubdivided in like manner into 10, to which is prefixed the number 20; to that of the fourth ſcale is prefixed the number 24; to that of the fifth, 32; that of the ſixth, 40; that of the ſeventh, 48; denoting the number of ſubdiviſions equal to an inch, in each, reſpectively.

The two laſt ſcales are broken off, to make room for two lines of chords. There is alſo on the back-ſide of the inſtrument a diagonal ſcale. See Scale.

As to the uſe of the plotting, if we were required to lay down any diſtance upon paper, ſuppoſe 6 chains 50 links: draw an indefinite line; then ſetting one foot of the compaſſes at figure 6 on the ſcale, *e. gr.* the ſcale of 20 in an inch, extend the other to 5 of the ſubdiviſions, for the 50 links: this diſtance, being transferred to the line, will exhibit the 6 chains 50 links required.

If it be deſired to have 6 chains 50 links take up more or leſs ſpace, take them off from a greater or leſſer ſcale, *i. e.* from a ſcale that has more or fewer diviſions in an inch.

To find the chains and links contained in a right line, *e. gr.* that is juſt drawn, according to any ſcale, *e. gr.* that of 20 in an inch. Take the length of the line in the compaſſes, and applying it to the given ſcale, you will find it extend from the number 6 of the great diviſions, to 5 of the ſmall ones: hence the given line contains 6 chains 50 links.

PLOVER, *pluvialis*, in ornithology, the engliſh name of ſeveral very diſtinct birds; as the green plover, or variegated black and yellowiſh charadrius, about the ſize of the common lapwing; and the grey plover, or blackiſh-brown tringa, with a black beak and green legs, a very beautiful bird. See the articles Charadrius and Tringa.

Baſtard-Plover, the name by which the vanellus, or lapwing, is called in ſeveral parts of the kingdom. See the article Vanellus.

PLOUGH, in agriculture, a machine for turning up the ſoil, contrived to ſave the time, labour, and expence that without this inſtrument muſt have been employed in digging land, to prepare it for the ſowing of all kinds of grain.

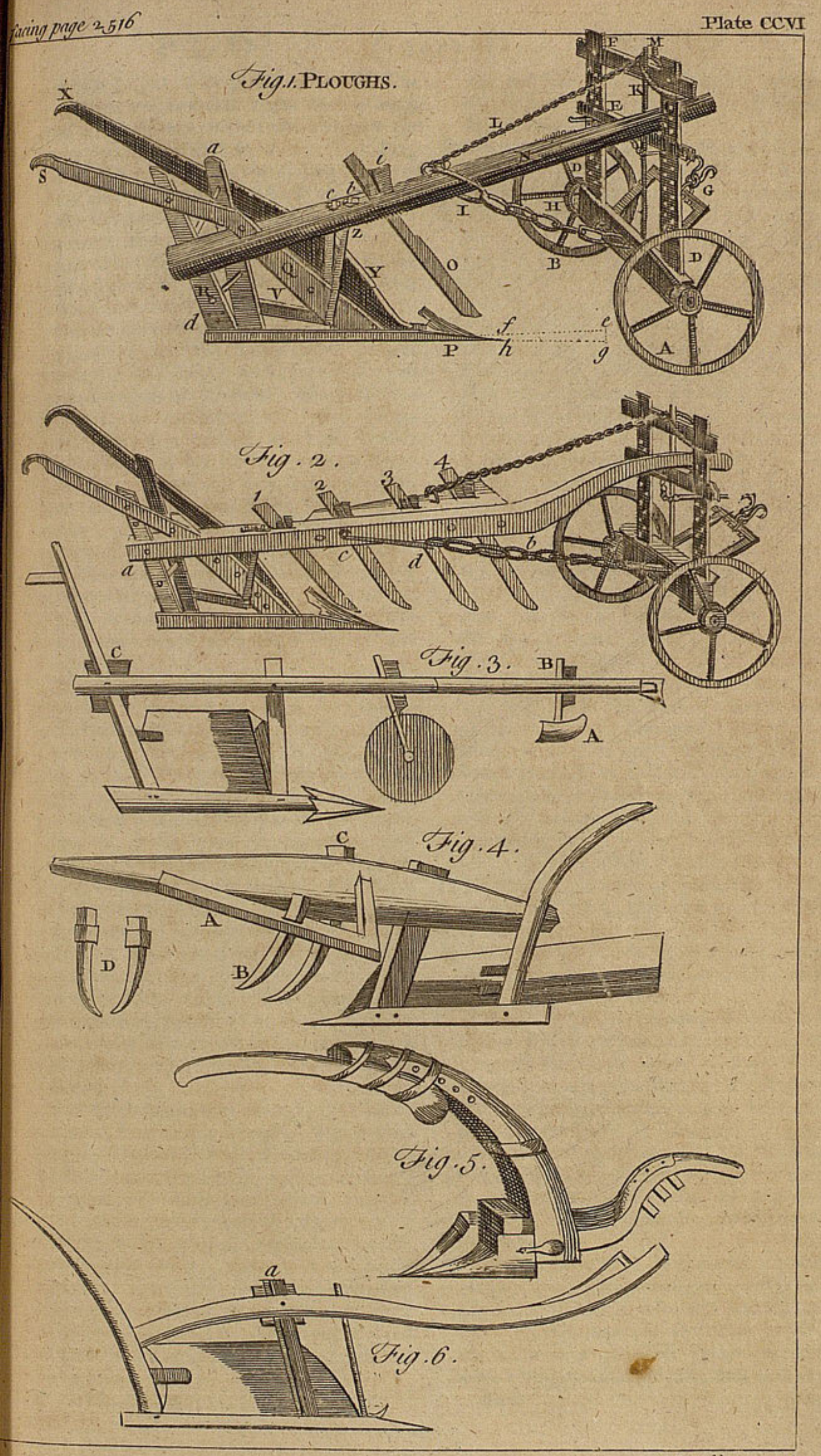
The ſtructure of a plough is various for various kinds of grounds; but the common two-wheeled plough, in plate CCVI. fig. 1. uſed in almoſt all the countries in the ſouth of England, is generally eſteemed the beſt for all ſorts of land, except ſuch miry clays as ſtick to the wheels, and clog them up ſo as to prevent their turning round. It is commonly divided into two parts, the plough-head, and the plough-tail. The plough head contains the two wheels A, B, and their axis, or iron-ſpindle, which paſſes through the box C, and turns round both in it and in the wheels; the two crow-ſtaves D, D, faſtened perpendicularly into the box, having in each two rows of holes, in order to raiſe or ſink the beam, by pinning up or down the pillow E, to encreaſe or diminiſh the depth of the furrow; the gallows F, through which the crow-

ſtaves

ftaves pafs at top, by mortoifes into which they are pinned; G the wilds, with its links and crooks of iron, by which the plough is drawn; H the tow-chain, which faftens the plough-tail to the plough-head, by the collar I at one end, and by the other end paffing through a hole in the middle of the box, where it is pinned in by the ftake K; L the bridle-chain, one end of which is faftened to the beam with a pin, and the other end to the top of the ftake, which ftake is held up to the left crow-ftaff, by the end of the wyth or rope M paffing round it above, and under the end of the gallows below, or by the end of the bridle-chain itfelf, when that is long enough. The plough-tail confifts of the beam, N; the coulter, O; the fhare, P; and the fheat, Q; the hinder fheat, R, paffing thro' the beam near its end; S the fhort handle, faftened to the top of the hinder fheat by a pin, and to the top of the fore-fheet by another pin; T the drock, which belongs to the right-fide of the plough-tail, and to which the ground-wrift V is faftened; as is the earth-board, whofe fore-part W, is feen before the fheat; as alfo the long handle X, whofe fore-part Y appears before the fheat, and is faftened to the drock by the pin at *a*, the other end of which pin goes into the beam. Z is the double reach, which holds up the fheat, and paffes through the beam to be faftened by its fcrews and nuts at *b* and *c*.

The ftructure of the four-coultered plough (*ibid.* fig. 2.) is in feveral refpects different from this, though in general founded on it. Its beam is ten feet four inches long, whereas that of the common plough is but eight feet: it differs alfo in fhape; for as the other is ftraight from one end to the other, this is ftraight only from *a* to *b*, and thence turns up, in the manner fhewn in the plate; fo that a perpendicular line let down from the corner at *a*, to the even furface on which the plough ftands, would be eleven inches and an half, which is its height in that place; and if another line was let down from the turning of the beam at *b*, to the fame furface, it would be one foot eight inches and a half, which is the height the beam ftands from the ground at that part; and a third line let down to the furface from the bottom of the beam, at that part which bears upon the pillow, will fhew the beam to be, in that part, two feet ten inches high above the furface. At the diftance of three feet two inches from the end of the beam, at the plough-tail, the firft coulter, or that next the fhare, is let through: and at thirteen inches from this, a fecond coulter is let through: a third at the fame diftance from that; and, finally, a fourth at the fame diftance from the third. The crookednefs of the beam is to avoid the too great length of the foremoft coulters, which would be fo long if the beam was ftraight all the way, that they would be apt to bend and be difplaced, unlefs they were vaftly thick and clumfy.

The fheat in this plough is to be feven inches broad, and the fixing the fheat in this, as well as in the common plough, is the niceft part, and requires the utmoft art of the maker; for fuppofing the axis of the beam, and the left-fide of the fhare to be both horizontal, they muft never be fet parallel to each other; but the ftraight fide of the fhare muft make an angle on the left-fide of the beam, which muft be very acute, that the tail of the fhare may prefs lefs againft the fide of the trench than the point does: this angle is fhewn by the pricked lines at the bottom of fig. 1. where the line *ef* is fuppofed to be the axis of the beam let down to the ground, and the line *gh*, parallel to the left-fide of the fhare. The great thing to be taken care of, is the placing the four coulters, which muft be fo fet that the four imaginary planes defcribed by the four edges, as the plough moves forwards, may be all parallel to each other, or very nearly fo; for if any one of them fhould be very much inclined to, or fhould recede much from either of the other, then they would not enter the ground together. In order to the placing them thus, the fecond coulter-hole muft be two inches and a half more on the right-hand than the firft; the third muft be as much more to the right of the fecond; and the fourth the fame diftance to the right of the third: and this two inches and a half muft be carefully meafured from the center of one hole to the center of the other. Each of thefe holes is a mortoife of an inch and a quarter wide, and is three inches and a half long at the top, and three inches at the bottom. The two oppofide fides of the holes are parallel to the top and bottom, but the back is oblique, and determines the obliquity of the ftanding of the coulter, which is wedged



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wedged tight up by pieces of wood. The coulters are two feet eight inches long, of which fixteen inches are allowed for the handle, which is to be thus long that the coulter may be drawn down as the point wears away. As to the wheels, the left-hand wheel is twenty inches diameter, and that on the right-hand, two feet three inches; and the diftance the wheels are fet from each other is two feet five inches and a half.

Befides thefe there are the Lincolnfhire-plough, proper for fenny lands fubject to weeds and fedges, and remarkable for the largenefs of its fhare, which is frequently a foot broad and very fharp, (*ibid.* fig. 3.). At A is a foot, which is fet higher or lower, by a wedge drove in at B; and which keeps the forepart of the plough from going deeper than they would have it. At C there are wedges by which the hinder part is fet. Inftead of a coulter there is a wheel with a fharp edge, which cuts the roots of the grafs or fedge as it turns round, while the broad fhare cuts them up at the bottom.

The Caxton or trenching-plough, invented to cut drains about Caxton in Cambridgefhire, in ftiff, miry, clay-ground. This plough (*ibid.* fig. 4.) is larger and ftronger than ordinary: to the beam is fixed a piece of wood at A, in which is a coulter fet at B, and another fet in the beam at C, which two coulters ftand bending inwards as at D, to cut each fide of the trench. The fhare is very flat and broad, in order to form the bottom of the trench; and the mould-board is three times the length of other ploughs, in order to caft the turf a great way from the trench. This plough cuts a trench a foot wide at the bottom, a foot and a half broad at the top, and a foot deep, and it is drawn with twenty horfes.

But the moft common plough, fays Mortimer, is the dry-plough, reprefented fig. 6. which is beft for miry clays, when the land is foft; but is extremely bad in fummer, when the land is hard, becaufe its point will be continually flying out of the ground: it is fet higher or lower, by wedges at *a*. Fig. 5. is a fpanifh plough, with which, and one horfe, they will plow two or three acres of their light lands in a day. We have given a figure of it, merely on account of its fingularity.

For the hoe and drill-ploughs, invented by Jethro Tull, efq; fee his Effay on Horfe hoeing hufbandry.

PLOUGH, among book-binders, is a machine for cutting the edges of the leaves of books fmooth. See BOOK-BINDING.

PLOUGHMAN, the perfon who guides the plough in the operation of tilling. See TILLAGE and PLOUGH.

PLOUGHMAN'S SPIKENARD. See the article SPIKENARD.

PLOUGHING, or PLOWING, in agriculture, turning up the earth with a plough. Ploughing is principally either that of lays or of fallows. Plowing of lays, is the firft cutting up of grafs-ground for corn, and is a work commonly performed in January. The beft time for doing it is when the land is wet, becaufe the turf is then foft and tough, and will turn up without breaking. In the well turning of this confifts the chief part of this fort of ploughing, which if rightly performed, will lay the turf fo flat and true, that it can hardly be feen where the plough went. This, indeed, depends greatly upon the make of the plough; but if the earth-board does not turn the turf well, fome nail upon it a fmall piece of wood to take the upper part of the earth as it rifes upon the earth board, which caufes it to fall with the grafs-fide downwards. Plowing of fallows, called alfo fallowing, is preparing land by ploughing long before it is plowed for feed. See the article FALLOWING.

PLUDENTS, a town of Germany, in the county of Tyrol, fixty-five miles weft of Infpruc.

PLUG, a large wooden peg made to ftop the bottom of a ciftern, or a hole in a cafk, pipe, or the like.

PLUKNETIA, in botany, a genus of plants, the characters of which are not fo certainly known as to fay to which clafs it belongs: the male and female flowers are produced feparately on the fame plant; the corolla is compofed of four oval and patent petals, and the ftamina form a fhort pyramidal body: the fruit is a depreffed quadrangular capfule, containing a fingle, roundifh and compreffed feed.

PLUM-TREE, *prunus*, in botany, a genus of the icofandria-monogynia clafs of plants, the flower whereof confifts of five roundifh, concave and large petals: the fruit is a roundifh drupe, marked with a longitudinal furrow, and contain-

ing a compressed and acute-pointed nut, with the sutures standing out each way in an edge.

This genus comprehends the plum, cherry, and apricot, three well known kinds of fruit.

Hog's PLUM, a plant called by botanists spondias. See the article SPONDIAS.

Date PLUM, diospyros. See DIOSPYROS.

PLUMAGE, the feathers which serve birds for a covering. See FEATHER.

Plumage is, in falconry, particularly understood of the feathers under a hawk's wing. Falconers give their hawks small feathers to make them cast, and these also they call plumage.

PLUMB-LINE, among artificers, denotes a perpendicular to the horizon; so called as being commonly erected by means of a plummet. See PLUMMET.

PLUMBAGO, LEADWORT, in botany, a genus of the pentandria-monogynia class of plants, the flower of which consists of a single funnel-fashioned petal; and its seed is single, and contained in the cup.

PLUMBAGO, MOCK-LEAD, or BLACK-LEAD, in mineralogy, a fossil substance, resembling lead-ore, much used in drawing, and for making pencils. See the article PENCIL.

It is somewhat difficult to ascertain what class of minerals black-lead belongs to. Metal it is not, as not being either ductile or even fusible; nor can it be reckoned among stones, for want of hardness: it remains, therefore, that it must be placed among the earths, though it dissolve not in water, as most earths will, except stiff clays and ochres; among the latter whereof Dr. Plott judges it may be reckoned, it seeming to be a sort of close earth, of very fine and loose parts, so burnt as to become black and shining, discolouring the hands, as all ochres do. Whence the most proper name that can be given it, according to this author, is *ochra nigra*, or black ochre. See the article OCHRE.

PLUMBERY, the art of casting and working lead, and using it in buildings, &c. See the article LEAD.

As this metal melts very easily, it is easy to cast it into figures of any kind, by running it into moulds of brass, clay, plaster, &c. But the chief article in plumbery is sheets and pipes of lead; and as these make the basis of the plumber's work, we shall here give the process of making them. In casting sheet-lead, a table or mould is made use of, which consists of large pieces of wood well jointed, and bound with bars of iron at the ends, on the sides of which runs a frame consisting of a ledge, or border of wood, two or three inches thick, and two or three inches high from the mould, called the sharps: the ordinary width of the mould, within these sharps, is from three to four feet; and its length is sixteen, seventeen, or eighteen feet. This should be something longer than the sheets are intended to be, in order that the end where the metal runs off from the mould may be cut off, because it is commonly thin, or uneven, or ragged at the end. It must stand very even or level in breadth, and something falling from the end in which the metal is poured in, *viz.* about an inch, or an inch and a half, in the length of sixteen or seventeen inches. At the upper end of the mould stands the pan, which is a concave triangular prism, composed of two planks nailed together at right angles, and two triangular pieces fitted in between them at the ends. The length of this pan is the whole breadth of the mould in which the sheets are cast; it stands with its bottom, which is a sharp edge, on a form at the end of the mould, leaning with one side against it; and on the opposite side is a handle to lift it up by, to pour out the melted lead; and on that side of the pan next the mould, are two iron-hooks to take hold of the mould, and prevent the pan from slipping, while the melted lead is pouring out of it into the mould. This pan is lined on the inside with moistened sand, to prevent it from being fired by the hot metal. The mould is also spread over, about two thirds of an inch thick, with sand sifted and moistened, which is rendered perfectly level by moving over it a piece of wood called a strike, by trampling upon it with the feet, and smoothing it over with a smoothing plane, which is a thick plate of polished brass, about nine inches square, turned up on all the four edges, and with a handle fitted on to the upper or concave side. The sand being thus smoothed, it is fit for casting sheets of lead; but if they would cast a cistern, they measure out the bigness of the four sides, and having taken the dimensions of the front, or fore-part, make mouldings by pressing long slips of wood, which contain the same mouldings into the level sand, and form the figures of birds, beasts, &c. by

by preffing in the fame manner leaden figures upon it, and then taking them off, and at the fame time fmoothing the furface where any of the fand is raifed up, by making thefe impreffions upon it. The reft of the operation is the fame in cafting either ciftetns or plain fheets of lead: but before we proceed to mention the manner in which that is performed, it will be neceffary to give a more particular defcription of the ftrike. The ftrike then is a piece of board about five inches broad, and fomething longer than the breadth of the mould on the infide; and at each end is cut a notch, about two inches deep, fo that when it is ufed, it rides upon the fharps with thofe notches. Before they begin to caft, the ftrike is made ready by tacking on two pieces of an old hat on the notches, or by flipping a cafe of leather over each end, in order to raife the under fide about one eighth of an inch, or fomething more, above the fand, according as they would have the fheet to be in thicknefs; then they tallow the under edge of the ftrike and lay it acrofs the mould. The lead being melted, it is ladled into the pan, in which, when there is a fufficient quantity for the prefent purpofe, the fcum of the metal is fwept off with a piece of board to the edge of the pan, letting it fettle on the fand, which is by this means prevented from falling into the mould at the pouring out of the metal. When the lead is cool enough, which is known by its beginning to ftand with a fhell or wall on the fand round the pan, two men take the pan by the handle, or elfe one of them lift it up by a bar and chain fixed to a beam in the ceiling, and pour it into the mould, while another man ftands ready with the ftrike, and, as foon as they have done pouring in the metal, puts on the mould, fweeps the lead forward, and draws the overplus into a trough prepared to receive it. The fheets being thus caft, nothing remains but to planifh the edges in order to render them fmooth and ftrait: but if it be a ciftern it is bent into four fides, fo that the two ends may join the back, where they are foldered together, after which the bottom is foldered up.

The method of cafting thin fheets of lead. Inftead of fand, they cover the mould with a piece of woolen ftuff nailed down at the two ends to keep it tight, and over this lay a very fine linen cloth. In this procefs great regard is had to the juft degree of heat, fo as that the lead may run well and yet not burn the linen. This they judge of by a piece of paper, for it takes fire in the liquid lead if it is too hot, and if it be not fhrunk and fcorched a little, it is not hot enough. They have here a ftrike different from that defcribed above: it is a wooden cafe, only clofed on three fides: it is pretty high behind, but the two fides, like two acute angles, ftill diminifh to the tip from the place where they are joined to the third or middle piece, where they are of the fame height therewith, *viz.* feven or eight inches high: the width of the middle makes that of the ftrike, which again makes that of the fheet to the caft. This ftrike is placed at the top of the mould, which in that part is firft covered with a pafteboard that ferves as a bottom to the cafe, and prevents the linen from being burnt while the lead is pouring in. The ftrike is now filled with lead, according to the quantity to be ufed; which done, two men, one at each fide, draw the ftrike down the mould with a velocity greater or lefs, as the fheet is to be more or lefs thick.

The method of cafting pipes without foldering. To make thefe pipes they have a kind of little mill, with arms or levers to turn it withal. The moulds are of brafs, and confift of two pieces, which open and fhut by means of hooks and hinges, their inward caliber, or diameter, being according to the fize of the pipe to be made, and their length is ufually two feet and a half. In the middle is placed a core, or round piece of brafs or iron, fomewhat longer than the mould, and of the thicknefs of the inward diameter of the pipe. This core is paffed through two copper-rundles, one at each end of the mould, which they ferve to clofe; and to thefe is joined a little copper-tube about two inches long, and of the thicknefs the leaden pipe is intended to be of. By means of thefe tubes the core is retained in the middle of the cavity of the mould. The core being in the mould, with the rundles at its two ends, and the lead melted in the furnace, they take it up in a ladle and pour it into the mould by a little aperture at one end, made in the form of a funnel. When the mould is full they pafs a hook into the end of the core, and turning the mill, draw it out; and then opening the mould take out the pipe. If they defire to have the pipe lengthened,

 they

they put one end of it in the lower end of the mould, and paſs the end of the core into it; then ſhut the mould again, and apply its rundle and tube as before, the pipe juſt caſt ſerving for rundle, &c. at the other end. Things being thus replaced they pour in freſh metal, and repeat the operation till they have got a pipe of the length required.

For making pipes of ſheet-lead, the plumbers have wooden cylinders, of the length and thickneſs required, and on theſe they form their pipes by wrapping the ſheet around them, and ſoldering up the edges all along them. See PIPE.

PLUMBUM, LEAD, in natural hiſtory. See the article LEAD.

PLUME, a ſet or bunch of oſtrich-feathers pulled out of the tail and wings, and made up to ſerve for ornaments in funerals, &c.

Among ſportſmen, plume is the general colour or mixture of the feathers of a hawk, which ſhews her conſtitution. See the article HAWK.

PLUME, or PLUMULE, in botany, a little membrane of the grain or ſeed of a plant, being that which, in the growth of the plant, becomes the ſtem or trunk thereof. See the article SEED, &c.

PLUMERIA, RED JASMINE, in botany, a genus of the pentandria-monogynia claſs of plants, the corolla of which conſiſts of a ſingle funnel-like petal, with a long tube, and divided into five oblong ſegments at the limb: the fruit is compoſed of two jointed and ventricoſe follicles, formed of a ſingle valve each, and containing numerous oblong ſeeds. See plate CXCIX. fig. 5.

PLUMMET, PLUMB RULE, or PLUMB-LINE, an inſtrument uſed by carpenters, maſons, &c. in order to judge whether walls, &c. be upright planes, horizontal, or the like. It is thus called from a piece of lead, *plumbum*, faſtened to the end of a chord, which uſually conſtitutes this inſtrument. Sometimes the ſtring deſcends along a wooden ruler, &c. raiſed perpendicularly on another; in which caſe it becomes a level. See LEVEL.

PLUMMING, among miners, is the method of uſing a mine-dial, in order to know the exact place of the work where to ſink down an air-ſhaft, or to bring an adit to the work, or to know which way the load inclines when any flexure happens in it.

It is performed in this manner: A ſkilful perſon, with an aſſiſtant, and with pen, ink, and paper, and a long line and a ſun-dial, after his gueſs of the place above ground, deſcends into the adit or work, and there faſtens one end of the line to ſome fixed thing in it, then the incited needle is let to reſt, and the exact point where it reſts is marked with a pen: he then goes on farther in the line ſtill faſtened, and at the next flexure of the adit he makes a mark on the line by a knot or otherwiſe; and then letting down the dial again, he there likewiſe notes down that point at which the needle ſtands in this ſecond poſition. In this manner he proceeds, from turning to turning, marking down the points, and marking the line, till he comes to the intended place; this done, he aſcends and begins to work on the ſurface of the earth what he did in the adit, bringing the firſt knot in the line to ſuch a place where the mark of the place of the needle will again anſwer its pointing, and continues this till he comes to the deſired place above ground, which is certain to be perpendicularly over the part of the mine into which the air-ſhaft is to be ſunk.

PLUMOSE, ſomething formed in the manner of feathers, with a ſtem and fibres iſſuing from it on each ſide: ſuch are the antennæ of certain moths, butterflies, &c.

PLUNGER, in mechanics, the ſame with the forcer of a pump. See FORCER.

PLURAL, *pluralis*, in grammar, an epithet applied to that number of nouns and verbs which is uſed when we ſpeak of more than one thing; or that which expreſſes a plurality or number of things. See the article NUMBER.

In latin, &c. both nouns and verbs have uſually diſtinct terminations to their different numbers: in Engliſh, nouns ſubſtantive uſually become plural by the addition of *s*, or *es*, to the ſingular. Nouns adjective are the ſame in both numbers; and in verbs the number is diſtinguiſhed by that of the pronouns or perſons.

PLURALITY, *pluralitas*, a diſcrete quantity, conſiſting of two or a greater number of the ſame kind: thus we ſay a plurality of gods, &c.

Hence plurality of benefices, or livings, is where the ſame clerk is poſſeſſed of two or more ſpiritual preferments, with cure of ſouls. In a plurality of livings, the firſt, *ipſo facto*, becomes void; on which account, the patron may preſent to it, provided the clerk be not qualified by

by difpenfation, &c. to hold more livings than one, in regard the law ftrictly enjoins refidence; this being impoffible where the fame perfon has more than one living, in different places. As the power for granting difpenfations for the holding two benefices, &c. is vefted in the king, it is held that, in thefe cafes, the archbifhop's difpenfation, and the king's confirmation of it, are neceffary to hold pluralities: but a deanery fhall not be taken to be a benefice, fo as to need a difpenfation, on the dean's having another fpiritual preferment; alfo a parfonage and vicarage make no plurality.

PLURIES, in law, the name of a writ which iffues after two former writs have gone out without any effect; for firft, an original writ, called a capias, goes out, which not being obeyed, there goes out an alias, which likewife failing, the pluries iffues.

PLUS, in algebra, a character marked thus +, ufed for the fign of addition. See the article CHARACTER.

PLUSH, in commerce, &c. a kind of ftuff having a fort of velvet knap, or fhag, on one fide, compofed regularly of a woof of a fingle woolen thread and a double warp, the one wool, of two threads twifted, the other goats or camels hair; though there are fome plufhes entirely of worfted, and others compofed wholly of hair.

Plufh is manufactured, like velvet, on a loom with three treadles; two of thefe feparate and deprefs the woolen warp, and the third raifes the hair-warp, upon which the workman throwing the fhuttle, paffes the woof between the woolen and hair-warp; and afterwards laying a brafs-broach, or needle, under that of the hair, he cuts it thereon with a knife deftined for that ufe; conducting the knife on the broach, which is made a little hollow all its length, and thus gives the furface of the plufh an appearance of velvet. See VELVET.

There are other kinds of plufh, all of filk; fome of which have a pretty long knap on one fide, and fome on both.

PLUSQUAMPERFECT, in grammar. See the article PRETERIT.

PLUVIAL, *pluviale*, antiently fignified a hood or cloak, which ecclefiaftics, chiefly religious, wore in the country to fhelter themfelves from the rain. The word is now ufed, in the romifh church, for a large hood worn by the chantor and fubdeacon at mafs and vefpers, &c. It covers the whole man, and is fixed before with two clafps.

PLUVIALIS, in zoology, the name whereby the latin authors call the plover. See the article PLOVER.

PNEUMATICS, called alfo PNEUMATOLOGY and PNEUMATOSOPHY, among fchoolmen, the doctrine and contemplation of fpirits and fpiritual fubftances, as God, angels, and the human foul, in which fenfe pneumatics are the fame with what we otherwife call metaphyfics. See the article METAPHYSICS.

PNEUMATICS is more commonly ufed among us, for that part of natural philofophy which treats of the nature and properties of the air; the doctrine and laws of which will be found under the articles AIR, ATMOSPHERE, PRESSURE, ELASTICITY, GRAVITY, COMPRESSION, RAREFACTION, EXPANSION, FLUID, &c.

PNEUMATIC ENGINE. See AIR-PUMP.

PNEUMATOCELE, *hernia flatulenta*, or WINDY RUPTURE, in furgery and medicine, a fpecies of hernia, which feveral authors affure us occurs in practice. The figns by which they tell us it may be difcovered are, 1. That upon handling the fcrotum it feels like a bladder diftended with wind; and that, therefore, 2. it feems to be much lighter than if it contained any humour, appearing alfo pellucid at the approach of a candle; and, 3. if it be ftruck by a fillup of the finger, it founds like a bladder which is diftended with wind, and ftruck in the fame manner. However, Heifter is of opinion that thefe authors have miftaken either the hyderocele or enterocele for the pneumatocele, and feems to be more confirmed in this opinion, not only becaufe the fymptoms and cure of this diforder, with which they acquaint us, agree exactly with thefe of the hyderocele, but becaufe that in all his practice he never obferved any thing like this diforder; this makes him at leaft fufpect that the cafe does not fo often occur as fome would infinuate: but whenever it is met with, he directs to proceed in the cure as follows. Let the tumour be treated externally with warm and difcutient medicines, as in the hyderocele, together with fomentations and plafters; and internally may be taken carminative and gentle purges: but if thefe take no effect, and the tumour ftill increafes, or continues the fame, the fcro-

tum ſhould then be perforated with the trochar, and its contents thereby diſcharged, which will demonſtrate whether it be wind or water.

PNEUMATOMACHI, Πνευματομαχοι, antient heretics, ſo called becauſe they oppoſed the divinity of the holy ſpirit, placing him in the number of creatures.

PNEUMATOSIS, πνευματωσις, a term which ſome authors uſe for the generation or formation of animal ſpirits in the brain.

PNEUMONICS, in pharmacy, medicines proper in diſeaſes of the lungs, in which reſpiration is affected. Of this number are ſulphur, lungwort, hyſſop, ground-ivy, and colt's-foot: they are uſed in phthiſes, aſthmas, peripneumonies, pleuriſies, &c.

PO, a great river of Italy, riſing in the Alps, and running firſt eaſt, ſoon after turns directly north, through Piedmont, where it receives the Doria: then paſſing north-eaſt, it diſcharges itſelf by ſeveral channels into the gulph of Venice.

POA, MEADOW-GRASS, in botany, a genus of the triandria-digynia claſs of plants, the corolla whereof is compoſed of two valves, of an ovato-acuminated figure, hollow, compreſſed, and ſomewhat longer than the cup, and without awns. It ſupplies the place of a pericarpium; and adheres every way to the ſeed, which is ſingle, of an oblong figure, compreſſed, and pointed at each end.

This is the moſt common of all graſſes with us, and makes principally the green covering of moſt of our fields and meadows.

POCHARD, in ornithology, the anas, with grey wings and a black rump. See the article ANAS.

POCK. See the article POX.

POCKET, in the woolen trade, a word uſed to denote a large ſort of bag, in which wool is packed up to be ſent from one part of the kingdom to another. The pocket contains uſually twenty-five hundred weight of wool.

POCKET-*inſtruments* and *medicines*, in ſurgery. See the articles INSTRUMENT and MEDICINES.

POCKLINGTON, a market-town in the eaſt riding of Yorkſhire: ſituated twelve miles ſouth-eaſt of York.

POD, among botaniſts, a term uſed to expreſs a pericarpium, conſiſting of two valves, which open from the baſe to the point, and are ſeparated by a membranaceous partition, from which the ſeeds hang by a kind of funiculus umbilicalis. See the article PERICARPIUM.

PODAGRA, in medicine, the gout in the feet. See the article GOUT.

PODALIA, a province of Poland, bounded by Volhinia and the ruſſian Ukrain, on the north and north-eaſt; by Budziac Tartary, on the ſouth-eaſt; by the river Nieſter, which ſeparates it from Beſſarabia and Moldavia, on the ſouth-weſt; and by the province of red-Ruſſia, on the north-weſt.

PODOMETER, or PEDOMETER, the ſame with perambulator. See the article PERAMBULATOR.

PODARIA, in zoology, a diviſion, order, or ſeries of wingleſs inſects, with ſhort bodies, and not very numerous legs; comprehending the puceron, pediculus, acarus, ſpider, ſquill, &c. See the article PUCERON, &c.

PODENSTEIN, a town of Germany, in the circle of Franconia: ſituated in eaſt long. 11° 35′, north lat. 49° 50′.

PODERIS, in antiquity, a robe hanging down to the foot, but chiefly uſed to expreſs a linen garment, a ſurplice, or a ſhirt.

The jewiſh prieſts were covered with this kind of ſurplice during their attendance in the temple; this being the proper habit of their order.

PODEX, in anatomy, &c. the ſame with anus or fundament. See ANUS.

PODOPHYLLUM, the MAY-APPLE, in botany, a genus of the polyandria-monogynia claſs of plants, the flower of which conſiſts of nine hollow and rounded petals, folded or plicated at the rim, and ſmaller than the cup: the fruit is an unilocular capſule of an oval figure, containing numerous and roundiſh ſeeds.

This plant is otherwiſe called anapodophyllum. See the article ANAPODOPHYLLUM, and plate XVII. fig. 2.

PODURA, the PUCERON, in zoology. See the article PUCERON.

POEM, Ποιημα, a compoſition in verſe of a due length and meaſure. See the articles VERSE and MEASURE.

Poems are generally denominated from the ſubject matter, as the apobaterion, epibaterion, epinicion, epithalamium, genethliac, elegiac, ſatiric, epitaph, panegyric, lyric, paſtoral, &c. and others from the manner of narration, as epic, dramatic, &c. to which may be added, odes, eclogues, and idylliums. To this head may alſo be referred ſeveral other compoſitions of a leſs ſerious kind, as the

the acroftic, enigma, anagram, cento, echo, &c. See each under its proper head: APOBATERION, &c.

The Abbé Du Bos obferves, in regard to poems, that fome are interefting in general, others in particular; that the beauties of execution alone do not conftitute a good poem: that the defects of poems are lefs difcernable than thofe of a picture; that our diflike falls only on the bad part of a poem; that every kind of poem has fomething particular in its ftyle; that by the beauty of the ftyle we muft judge of poems; that it muft be a long time before the merit of a good poem is diftinguifhed; and finally, that the character of the poetic ftyle has always decided the good or bad fuccefs of poems, even of thofe which by their length feem to have the greateft dependance on the œconomy of the plan, on the diftribution of the action, and on the decency of the manners.

POESY, the fame with poetry. See the article POETRY.

POET, ποιητης, the author of a poem. See the article POEM.

Homer, Virgil, Milton, and Taffo, are reckoned the chief, almoft the only, epic poets. Sophocles, Euripides, Shakefpear, Otway, Corneille, and Racine, the beft tragic poets. Ariftophanes, Menander, Plautus, Terence, Fletcher, Johnfon, Molliere, &c. the chief comic poets. Horace, Cowley, and Malherbe, excelled as lyric poets; and Juvenal, Perfius, Regnier, Boileau, Dryden, and Oldham, as fatiric poets.

POETICAL, fomething that relates to poetry or poets, in which fenfe we fay poetical genius, poetical licence, &c.

POETICAL *Juftice*, is chiefly ufed in refpect of the drama, to denote a diftribution of rewards and punifhments to the feveral perfons at the cataftrophe or clofe of a piece, anfwerable to the feveral characters they appeared in. See the articles CHARACTER and CATASTROPHE.

POETICAL *rifing and fetting of the ftars.* The three kinds of rifing and fetting, *viz.* the cofmical, acronical, and helical, were made by the antient poets, refering the rifing, &c. of the ftars to that of the fun. See COSMICAL, &c.

POETICS, the doctrine of poetry, or the laws and rules of conducting pieces, or compofitions of poetry, fuch is Ariftotle's poetics, a work much valued.

POETRY, the art of compofing poems, or pieces in verfe; or, as defined by Voffius, the art of reprefenting actions in metre.

Voffius thinks that love was the firft occafion of poetry, which is not improbable, confidering that this affection is coeval with mankind, is univerfal, and naturally productive of poetry; yet it undoubtedly owes its increafe and progrefs to religion: Dacier indeed calls it the offspring of religion; and it is certain, in the earlieft ages of the world, that it was ufual to fing hymns to the honour of the gods upon folemn feftivals. Du Bos thinks that poetry has been employed in all ages, even by the moft unpolifhed nations, to preferve the memory of paft events. Its principal aim is to flatter our fenfes and imagination: for, according to Plato, it awakes the fpiritual empire of the foul. Every kind of poetry charms us in proportion to its object, fays Du Bos; and to be very affecting, it ought to be very exact. It is not the fame with poetry as with other arts, for an ignorant perfon may judge of poetry by the impreffion it makes on him: whence all men have a right to give their opinion concerning a piece of poetry, and this judgment ought to be founded on experience rather than on argumentation. Poetry is an art where every thing fhould pleafe. It is not enough to exhibit nature, which in certain places and circumftances is rude and unpleafant, but the poet muft chufe in her what is beautiful from what is not: whence a poet ought to chufe, for the fubject of his imitation, fomething that is naturally affecting. There is a particular rhetoric for poetry, which confifts in difcerning very precifely what ought to be faid figuratively, and what to be fpoken fimply; and in knowing where ornament is required, and where not: yet the ftyle fhould be copious, and every fpecies of writing in this art fhould have a diction proper to itfelf. The qualifications then neceffary for poetry, or thofe which form a good poet, are feldom found united in one perfon: he muft have an extraordinary genius, great natural gifts, a wit juft, piercing, folid, and univerfal; an underftanding clear and diftinct; an imagination neat and pleafant; an elevation of foul that depends not on art, or ftudy, and which is purely a gift of heaven, and muft be fuftained by a lively fenfe and vivacity, a great judgment to confider wifely of things, and

and a vivacity to exprefs them with that grace and abundance which gives them beauty. In fine, to accomplifh a poet, is required a temperature of wit and fancy, of ftrength and fweetnefs, of penetration and delicacy; but, above all, he muft have a fovereign eloquence, and a profound capacity. Thefe are the qualities that muft concur together to form the genius of a poet, and fuftain his character. The rules of poetry and verfifying are taught by art, and acquired by ftudy; but this force and elevation of thought, which Horace calls fomething divine, and which alone makes the poetry of any value, muft be derived from nature; or, according to Ariftotle, from fome happy tranfports, to which that author gives the name of madnefs. Hence the critics conclude, the end of poetry is to pleafe; its caufe, either the excellence of the poet's genius, or a poetical fury and tranfport of the foul, manageable by the judgment; its matter, long and fhort fyllables, and feet compofed hereof, with words furnifhed by grammar; and its form the arrangement of all thefe things in juft and agreeable verfe, expreffing the thoughts and fentiments of the author after the manner already mentioned. But after all, how narrow are all thefe bounds, if we confider poetry in the light wherein the works of Homer and Virgil have fet it. This, which is therefore diftinguifhed by the name of the greater poetry, in contradiftinction to the low and fimple, or verfification, confifts principally in fiction, or the invention of fables, in the expreffing of things by allegories, and metaphors, and in the inventing of actions, under which the truths which the poet has to teach, may be agreeably difguifed. See Mythology, &c.

The laws of epic and dramatic poetry, fee under the articles Epic, Character, Invocation, Catastrophe, Dramatic, Act, Scene, Sentiments, &c.

For the lower forts of poetry, fee the articles Ode, Song, Epigram, Elegy, Satyr, &c.

POGGE, *cataphractus*, in ichthyology. See the article Cataphractus.

POGGIO imperial, a city of Italy, in the dutchy of Tufcany, fituated fixteen miles fouth of Florence.

POICTIERS, the capital of Poictou, in France, fituated on an eminence, near the river Clain: eaft long. 15′, north lat. 46° 40′.

POICTOU, a territory of France, in the province of Orleanois, fituated fouth of the river Loire, being bounded by the provinces of Anjou and Britany on the north, by Touraine and Berry on the eaft, by Santoign, Angoumois, and Aunis on the fouth, and by the ocean on the weft. It is one hundred and fifty miles long, and feventy broad.

POINCIANA, in botany, a genus of the decandria-monogynia clafs of plants, the corolla whereof confifts of five unequal petals; the four upper petals are roundifh and nearly equal, the fifth is larger, difform, and crenated; the fruit is an oblong depreffed pod, with fepta; the feeds are fingle, and placed lengthwife in the pod. See plate CCXI. fig. 2.

POINSON, in the manege, a little point, or piece of fharp-pointed iron, fixed in a wooden-handle, which the cavalier holds in his right hand, when he means to prick a leaping horfe in the croup, or beyond the end of the faddle, in order to make him jerk out behind.

POINT, a term ufed in various arts.

Point, *punctum*, in geometry, as defined by Euclid, is a quantity which has no parts, or which is indivifible. Points are the ends or extremities of lines. If a point be fuppofed to be moved any way, it will, by its motion, defcribe a line. See the article Line.

Point *of contrary flexure*. See the article Flexure.

Point, in phyfics, the leaft fenfible object of fight, marked with a pen, point of a compafs, or the like. Of fuch points all phyfical magnitude confifts. This phyfical point is the fame with what Mr. Locke calls the point fenfible, and which he defines to be the leaft particle of matter, or fpace, we can difcern. He adds, that to the fharpeft eye, this is feldom lefs than thirty feconds of a circle, whereof the eye is the center.

Point, in grammar, a character ufed to mark the divifions of difcourfe. A point proper, is what we otherwife call a full ftop or period. See Period.

For the other points, fee the articles Comma, Colon, and Semicolon.

For the points of interrogation and admiration, fee the articles Interrogation and Admiration.

The points, or vowel points, in the hebrew grammar, are certain characters which, in the writings of that language, ferve to mark the vowels. The antiquity of thefe points make the fubject of a cele-

celebrated controversy, some maintaining their origin to be the same with that of the hebrew language; and others asserting them to have been first introduced by Esdras, after the babylonish captivity, when he compiled the canon, transcribed the books into the present chaldee character, and restored the purity of the hebrew text. Some will have them invented by the doctors of the school of Tiberias, usually called the massoretes, five or six hundred years after Christ.

Point, in music, a mark or note antiently used to distinguish the tones or sounds: hence we still call it simple counter-point, when a note of the lower part answers exactly to that of an upper; and figurative counter-point, when any note is syncopated, and one of the parts makes several notes or inflections of the voice, while the other holds on one. See the article Counter-point.

We still use a point, to raise the value of a note, and prolong its time by one half, *e. g.* a point added to a semibreve instead of two minims, make it equal to three; and so of the other notes. See Time.

Point, in astronomy, a term applied to certain points or places, marked in the heavens, and distinguished by proper epithets.

The four grand points or divisions of the horizon, *viz.* the east, west, north, and south, are called the cardinal points. See Horizon, East, West, *&c.*

The zenith and nadir are the vertical points; the points wherein the orbits of the planets cut the plane of the ecliptic, are called the nodes: the points wherein the equator and ecliptic intersect, are called the equinoctial points; particularly, that whence the sun ascends towards the north pole, is called the vernal point; and that by which he descends to the south pole, the autumnal point. The points of the ecliptic, where the sun's ascent above the equator, and descent below it, terminate, are called the solsticial point; particularly the former of them, the estival or summer-point; the latter, the brumal or winter-point.

Point *of the horizon*, or *compass*, in navigation and geography. See the articles Horizon and Compass.

Point is also used for a cape or headland, jutting out into the sea: thus seamen say, two points of land are in one another, when they are so in a right line against each other, as that the innermost is hindered from being seen, by the outermost.

Point, in perspective, is used for various parts or places, with regard to the perspective plane. See Perspective.

Points, in heraldry, are the several different parts of an escutcheon, denoting the local positions of any figure. There are nine principal points in an escutcheon as represented in pl. CCV. fig. 3. where A shews the dexter chief; B, the precise middle chief; C, the sinister chief; D, the honour-point; E, the fess-point, called also the center; F, the nombril-point, that is, the navel-point; G, the dexter base; I, the sinister base; H, the precise middle base.

Columbier makes the points and their situations symbolical. As the several bearings in an escutcheon are so many types representing the commendable actions of the person they are given to, so the escutcheon itself represents the body of the man that performed them; and the points or parts signified by these letters, the principal parts of his body: thus A, B, C, represent the head, in which the three great faculties reside; D, the neck, where ornaments are chiefly borne; E, the heart, *&c.* See Escutcheon.

Point is also the name of an ordinary, something like a pile, rising frequently from the bottom of the escutcheon to the top, very narrow, and only taking up two thirds of the point of the escutcheon. When the point arises from the base, it is peculiarly called point in point. Point inverted, is when it descends from the chief downwards, possessing two thirds of the chief, but diminishing as it approaches the point of the escutcheon, though without touching it. Point in bend, or point in bar, is when the point is placed transverse in the situation of a bend or bar. When it comes from the sides of the escutcheon, it is also called the point dexter or sinister, according to its situation. The point dexter is commonly reputed an abatement due to a braggadocio; point-champion-ten, due for killing a prisoner after quarter demanded; point in point, a diminution belonging to a coward; point-plane, an abatement belonging to a lyar, *&c.* See the articles Diminution, *&c.*

Point is also used in heraldry for the lowest part of the escutcheon, which usually terminates in a point.

Point-champain. See Champain.

Point is also an iron or steel-instrument, used with some variety in several arts. Engravers, etchers, cutters in wood, *&c.* use

use points to trace their designs on the copper, wood, stone, &c. See the articles ENGRAVING, &c.

POINT, in the manufactories, is a general term, used for all kinds of laces, wrought with the needle; such are the point de Venice, point de France, point de Genoa, &c. which are distinguished by the particular oeconomy and arrangement of their points.

Point is sometimes used for lace woven with bobbins, as english point, point de Malines, point d'Havre, &c.

POINT, in architecture, See ARCH.

POINT, in poetry, denotes a lively brisk turn, or conceit, usually found or expected at the close of an epigram.

POINT-BLANK, in gunnery, denotes the shot of a gun, levelled horizontally. See the article GUNNERY.

POINTED, in heraldry. A cross pointed, is that which has the extremities turned off into points by straight lines.

POINTING, in grammar, the art of dividing a discourse, by points, into periods and members of periods, in order to shew the proper pauses to be made in reading, and to facilitate the pronunciation and understanding thereof. See the articles PUNCTUATION and PRONUNCIATION.

POINTING, in war, the levelling a cannon, or mortar, so as to play against any certain point. See the articles GUNNERY, QUADRANT, &c.

POINTING, among seamen, marking on the chart in what part or place the vessel is.

POINTING *the cable*, in the sea-language, is untwisting it at the end, lessening the yarn, twisting it again, and making all fast with a piece of marline, to keep it from ravelling out.

POIRINO, or POVERINO, a town of Italy, in the province of Piedmont, fifteen miles south-east of Turin.

POISON, in medicine, a malignant quality in some animal, vegetable, or mineral body, which renders it hurtful and even mortal to those who take it.

There are three essential marks of poisons, which distinguish them from other things that are noxious to human bodies. The first is, that they consist of most subtile parts, and are consequently pernicious in a small quantity. The second, that they in a short time prevent the regular motions of the solids and fluids throughout the body, and induce the most grievous symptoms, and even death itself. And the third, that they exercise their cruelty on the most subtile fluids, and the most nervous parts. Poisons are of various kinds, and operate in various manners; some by dissolving the blood, others by coagulating it, and others by corroding and destroying the solid parts. All the three kingdoms have poisons peculiar to themselves; but the animal kingdom affords the most subtile, which are communicated by the bite of mad or venomous beasts, when they are angered. The mineral kingdom produces arsenicals and mercurials. And the vegetable, herbs and plants of a most acrid, noxious, and deleterious quality, such as the most violent cathartics and narcotics. Every sort of poison seems to have an effect peculiar to itself; thus arsenic occasions the most cruel torments, convulsions, mortification of the coats of the intestines: the seeds of datura induce madness or absolute stupidity: opium brings on sleepiness, and a torpor on the mind: the berries of deadly nightshade produce madness, rage, or folly: litharge, unwarily taken, causes a convulsive colic, with an obstinate costiveness: the bite of a mad dog occasions the dread of water: the venom induced by the sting of a tarantula, produces wonderful effects; for the patient is delighted with musical instruments, and when he hears their sounds, immediately falls to capering: the sting of a scorpion produces a sudden chilness and exceeding cold sweats. The mineral kingdom furnishes very few real poisons; the only natural one is cobalt; the factitious are arsenic, corrosive sublimate, and glass of antimony. The most dangerous vegetable poisons are the true hemlock, wolf's bane, the deadly nightshade, henbane, and datura, to which may be added the roots of hemloc-dropwort.

Milk mixed with oil, is an excellent remedy against all corrosive poisons. Hoffman says, that he once prevented the death of ten young persons, who had taken among them almost two ounces of arsenic in water gruel, which in a short time produced the highest anxieties, and corroding tortures, by oil of sweet almonds and milk. They took at least ten quarts a piece, which they vomited up again before the reaching to vomit ceased. The same author also affirms, that milk, in a large quantity, is an universal remedy against all poisons that kill by inflammation, as hemloc does; and, if taken in time, will prevent their dreadful consequences. Allen thinks a vomit with warm water and oil, taken in large draughts,

draughts, and often repeated, will be of great fervice; as alfo warm water with frefh butter; milk and oil, or milk and butter: but for fat broths, which he alfo recommends, or any thing elfe which requires fome time for the preparation, they only allow the poifon to take deeper root, and therefore ought not to be waited for. If the above things will not provoke the patient to vomit, oxymel of fquills, falt of vitriol, or a decoction of tobacco may be ufed, as having a more immediate effect. It is hardly fafe to give even the moft gentle cathartic. The ftomach being thus emptied of all, or as much as poffible of the hemloc, recourfe muft be had to generous wine and alexipharmics, fuch as venice treacle, the bezoardic powder, &c. When there is a fufpicion that the coats of the ftomach or inteftines are corroded, or ulcerated, it will not be proper for the patient to ufe fpices or vinegar, nor to indulge in drinking too much wine; but to take a decoction of barley with raifins, or a decoction of china-root, faffafras, &c. The fame method is moft likely to anfwer when any deleterious herb or root has been eaten by miftake, though the particular fpecies fhould not be known: and Hoffman affirms, that when the patient has been ftupified by narcotics, the beft remedies are vomits mixed with oil. For the more effectual remedies for the bite of a mad dog, viper, rattle-fnake, &c. fee the articles HYDROPHOBIA, VIPER, RATTLE-SNAKE, &c.

To POISON *a piece*, with gunners, is the fame as to clog and nail it up.

POISON-OAK, *toxicodendron*, in botany. See the article TOXICODENDRON.

POISSY, a town of France, fifteen miles north-weft of Paris.

POLA, a port town of Iftria, ninety miles fouth-eaft of Venice.

POLACHIA, a province fituated in the middle of Poland, on the river Bug, eaftward of Maffovia or Warfovia.

POLAEDRASTYLA, in natural hiftory, the name of a genus of cryftals, compofed of many planes, and having no column. See the article CRYSTAL.

The bodies of this genus are cryftals compofed of two octangular pyramids, joined bafe to bafe, and confequently the whole body confifting of fixteen planes. Of this genus there are only two known fpecies. 1. A brown kind, with fhort pyramids, found in confiderable plenty in Virginia on the fides of hills. And, 2. A colourlefs one, with longer pyramids. This has yet been found only in one place, which is the great mine at Goffelaer, in Saxony, and there ufually lies at great depths.

POLAND, a large kingdom of Europe, fituated between 16° and 34° eaft longitude, and between 46° and 57° north latitude; bounded by Ruffia on the north and eaft; by Beffarabia, Moldavia, Tranfilvania, and Hungary on the fouth; and by Pomerania, Brandenburg, and Silefia on the weft; being almoft fquare, and feven hundred miles over either way.

The conftitution of Poland is a mixed monarchy, in which the nobility and gentry feem to have the greateft fhare, whence it is frequently called a republic. The king is elective by the whole body of the gentry, who oblige him to fwear to what conditions they pleafe.

POLAR, in general, fomething relating to the poles of the world, or poles of the artificial globes: thus we meet with polar circles, polar dial, polar projection, &c. See the articles CIRCLE, DIAL, &c.

POLARITY, the quality of a thing confidered as having poles; but chiefly ufed in fpeaking of the magnet. See the article MAGNET.

POLE, πόλος, in aftronomy, one of the extremities of the axis, on which the fphere revolves. See SPHERE and AXIS.

Thefe two points, each 90° diftant from the equinoctial or equator, are by way of eminence called the poles of the world; and the extremities of the axes of the artificial globes, correfponding to thefe points in the heavens, are termed the poles thereof. See the article GLOBE.

POLE, in fpherics, a point equally diftant from every part of the circumference of a great circle of the fphere, as the center is a plane figure; or it is a point of 90° diftant from the plane of a circle, and in a line, called the axis, paffing perpendicularly through the center. The zenith and nadir are the poles of the horizon; and the poles of the equator are the fame with thofe of the fphere.

POLES *of the ecliptic*, are two points on the furface of the fphere, 23° 30′ diftant from the poles of the world, and 90° diftant from every part of the ecliptic. See the article EARTH.

POLES, in magnetics, are two points of a loadftone, correfponding to the poles of the world; the one pointing to the north, the other to the fouth. See MAGNET.

POLE, or VERTEX *of a glafs*, in optics, is the

the thickest part of a convex, or the thinnest of a concave-glass. If the glass be truly ground, the pole will be exactly in the middle of its surface.

POLE, PERCH, or ROD, in surveying, is a measure containing sixteen feet and a half.

POLE, or POLAR STAR, is a star of the second magnitude, the last in the tail of ursa minor. Its longitude Mr. Flamsteed makes 24° 14′ 41″; its latitude, 66° 4′ 11″.

The nearness of this star to the pole, whence it happens that it never sets, renders it of vast service in navigation, &c. for determining the meridian line, the elevation of the pole, and, consequently, the latitude of the place, &c. See the article LATITUDE.

POLE-CAT, *putorius*. See PUTORIUS.

POLEMICAL, in matters of literature, an appellation given to books of controversy, especially those in divinity.

POLEMONY, *polemonium*, in botany, a genus of the pentandria-monogynia class of plants, with a monopetalous flower, divided into five roundish segments at the limb: the fruit is a roundish capsule, consisting of three cells, and containing a great many seeds in each.

The leaves of this plant are accounted detersive.

POLEMOSCOPE, in optics, a kind of reflecting perspective-glass invented by Hevelius, who commends it as useful in sieges, &c. for discovering what the enemy is doing, while the spectator lies hid behind an obstacle. See PERSPECTIVE. Its description is this: the interval bc, (pl. CCVII. fig. 1.) between the object-glass and the speculum, is enlarged by a tube, of a length sufficient to project the speculum beyond the obstacle that covers the observer. And for a further convenience of looking forward, as it were, he proposes to place another plane speculum fg, at the other end of the tube, to reflect the rays through a hole kl in its sides, in a direction ao, parallel to the incident rays Qc; and to place the concave eye-glass in this hole. By this means, the object will still appear upright, and magnified just as much as if the two speculums were removed, and the same eye-glass was placed in the axis of the tube: for in the rays Qc, oa, produced through the speculums de, fg, take $ci = cb$, and $ah = ab$; and supposing rays to flow both ways through b, the center of the object-glass, after reflection from the speculums they will diverge from the points h, i. Let two of them fall upon the object at P and R, and since $\angle PiR$ (or die) $= \angle dbe$ (or $fbg = fhb$) if the eye-glass was removed, the object would appear under the same angle fhg or khl, as it would appear under to the naked eye placed at i; but the reflected rays fk, gl, after refractions into km, ln, through the eye-glass kl, are inclined in the same angle to each other, as they would be if the speculum fg being removed they had been refracted through the same eye-glass placed in the axis of the tube, at the same distance from b as it is now from h: and by tracing an oblique ray, $Rebfkm$, it is manifest that the object appears upright; it also appears in the same posture, with respect to right and left, as to the naked eye. However, the length of the perspective ab must not be very great, otherwise it will take in so little at one view, as to make it difficult to find an object.

POLERON, one of the Banda, or nutmeg-islands, in the Indian-ocean: east long. 128°, south lat. 4°.

POLESIA, a province of Poland, bounded by Polachia and Lithuania, on the north; and by Volhinia, on the south.

POLESIN DE ROVIGO, a province of Italy, situated north of the Po, on the gulph of Venice.

POLESWORTH, a market-town, twenty miles north of Warwick.

POLIANTHES, in botany, a genus of the hexandria-monogynia class of plants, with a monopetalous, funnel-fashioned flower; and a roundish capsule for its fruit, with a great many semi-orbiculated seeds.

POLICANDRO, an island of the Archipelago, in east longitude 25°, north latitude 36° 30′.

POLICASTRO, a bishop's see of the kingdom of Naples, sixty miles south-east of Naples.

POLICY, or POLITY, in matters of government. See the article POLITY.

For policies of assurance, or insurance, on ships, houses, lives, &c. see the article INSURANCE.

These contracts of insurance, termed policies, are now made either at public or private offices; the insurances made on lives or liberties must be paid according to the tenor of the agreement, because these sorts of policies admit of no avarage. Where the words of a policy are,

"the ſhip warranted to depart with convoy," it ſhall be intended that ſhe keep with convoy during the voyage, if poſſible; and if ſhe depart willingly from the convoy, it is fraud. Either ſuppreſſing the truth, or alleging any falſehood, is ſufficient to diſcharge the policy; it being a general rule, that the inſured ſhall inform the inſurer of all material circumſtances which have come to his knowledge at the time of making the policy, in order that the contract may be fairly adjuſted.

POLICY, among letter-founders, denotes a certain proportion, obſerved among the letters that compoſe a font; or a rule, whereby to regulate the number of each. See the articles LETTER and FONT.

POLISHER, or BURNISHER, among mechanics, an inſtrument for poliſhing and burniſhng things proper to take a poliſh. The gilders uſe an iron-poliſher to prepare their metals before gilding, and the blood-ſtone to give them the bright poliſh after gilding.

The poliſher uſed by the makers of ſpurs and bits, &c. is partly iron, partly ſteel, and partly wood; it conſiſts of an iron-bar with a wooden handle at one end, and a hook at the other, to faſten it to another piece of wood held in the vice, while the operator is at work. In the middle of the bow, withinſide, is what is properly called the poliſher, being a triangular piece of ſteel with a tail, whereby it is riveted to the bow.

The poliſhers, among cutlers, are a kind of wooden wheels made of walnut-tree, about an inch thick, and of a diameter at pleaſure, which are turned round by the great wheel; upon theſe they ſmooth and poliſh their work with emery and putty.

The poliſhers for glaſs conſiſt of two pieces of wood; the one flat, covered with old hat, the other long and half-round, faſtened on the former, whoſe edge it exceeds on both ſides by ſome inches, which ſerve the workmen to take hold of, and to work backwards and forwards by.

The poliſhers, uſed by ſpectacle-makers, are pieces of wood a foot long, ſeven or eight inches broad, and an inch and a half thick, covered with old beaver-hat, whereon they poliſh the ſhell and horn-frames their ſpectacle-glaſſes are to be ſet in.

POLISHING, in general, the operation of giving a gloſs or luſtre to certain ſubſtances, as metals, glaſs, marble, &c. See the articles METAL, GLASS, &c.

The operation of poliſhing optic-glaſſes, after being properly ground, is one of the moſt difficult points of the whole proceſs. See GLASS and GRINDING.

Before the poliſhing is begun, it is proper to ſtretch an even well-wrought piece of linen over the tool, duſting thereupon ſome very fine tripoli. Then taking the glaſs in your hand, run round forty or fifty times upon the tool, to take off the roughneſs of the glaſs about the border of it. This cloth is then to be removed, and the glaſs to be poliſhed upon the naked tool, with a compound powder made of four parts tripoli mixed with one of fine blue vitriol; ſix or eight grains of which mixture, is ſufficient for a glaſs five inches broad. This powder muſt be wetted with eight or ten drops of clear vinegar, in the middle of the tool; being firſt mixed and ſoftened thoroughly with a very fine ſmall mullet. Then with a nice bruſh, having ſpread this mixture thinly and equably upon the tool, take ſome very fine tripoli, and ſtrow it thinly and equably upon the tool ſo prepared; after which take the glaſs to be poliſhed, wiped very clean, and apply it on the tool, and move it gently twice or thrice in a ſtraight line backwards and forwards; then take it off, and obſerve whether the marks of the tripoli, ſticking to the glaſs, be equably ſpread over the whole ſurface thereof; if not, it is a ſign that either the tool or glaſs is too warm; in which caſe, you muſt wait a while and try again, till you find the glaſs takes the tripoli every where alike. Then you may begin to poliſh boldly, there being no danger of ſpoiling the figure of the glaſs, which in the other caſe would infallibly happen. This is Mr. Huygens's method; but it ought to be obſerved, that almoſt every operator has a peculiar one of his own, and of which ſome of them make a mighty ſecret.

Sir Iſaac Newton no where expreſsly deſcribes his method of poliſhing optic-glaſſes; but his method of poliſhing reflecting metals, he thus deſcribes in his optics. He had two round copper-plates, each ſix inches in diameter, the one convex the other concave, ground very true to one another. On the convex one he ground the object-metal, or concave which was to be poliſhed, till it had taken the figure of the convex, and was ready for a

poliſh.

polish. He then pitched over the convex very thinly, by dropping melted pitch upon it, and warming it to keep the pitch soft, whilst he ground it with the concave copper wetted to make it spread evenly all over the convex, till it was no thicker than a groat piece; and after the convex was cold, he ground it again, to give it as true a figure as possible. He then ground it with very fine putty, till it made no noise; and then upon the pitch he ground the object-metal with a brisk motion for two or three minutes; when laying fresh putty upon the pitch, he ground it again till it had done making a noise, and afterwards ground the object-metal upon the pitch as before: and this operation he repeated, till the metal was perfectly polished.

POLITICAL, in general, something relating to policy or government. See the article GOVERNMENT.

Political arithmetic is the application of arithmetical calculation, to political subjects, as the public revenues, number of people, extent and value of lands, taxes, trade, manufactures, *&c.* of any commonwealth.

The calculations of this kind, which Sir William Petty attempted, Dr. Davenant gives some good reasons why many of his numbers are not to be entirely depended on; and therefore he advances others of his own, founded on the observation of Mr. Greg. King.

The land of England, he says, is 39 millions of acres; the number of people about 5,545,000, increasing about 9000 every year, allowance being made for plagues, *&c.* wars, shipping, plantations. The people in London he reckons at 530,000; those in the other cities and market towns, 870,000; and those in the villages and hamlets, at 4,100,000; the yearly rent of the land he accounts to be 10,000,000 l. that of the houses and buildings, 2,000,000 l. *per annum*; the produce of all kinds of grain, he reckons to be worth 9,075,000 l. in a moderate plentiful year; the rent of the corn lands annually 2,000,000 l. and their net produce above 9 000,000 l. the rent of the pastures, meadows, woods, forests, commons, heaths, *&c.* 7,000,000 l. The annual produce in butter, cheese, and milk, about 2,500,000 l. The value of wool, yearly shorn, about 2,000,000 l. Of horses yearly bred, about 250,000 l. Of the flesh yearly consumed, about 3,350,000 l. Tallow and hides, about 600,000 l. Hay yearly consumed by horses, 1,300,000 l. By other cattle, 1,000,000 l. The timber yearly felled for building, 500,000 l. Wood yearly burnt, *&c.* 500,000 l. The land of England is now about seven acres one quarter to each inhabitant. The value of the wheat, rye, and barley, necessary for the sustenance of England, at least, 6,000,000 l. *per ann.* The value of the woollen manufacture made here is about 8,000,000 l. *per annum*, and our exports of all kinds of woollen manufactures, above 2,000,000 l. *per annum.* The annual income of England, on which the people live, and out of which taxes of all kinds are paid, is now about 43,000,000 l. that of France, 81,000,000 l. and Holland, 18,250,000 l.

Major Grant, in his observations on the bills of mortality, computes that there are 39,000 square miles of land in England; that in England and Wales there are 4,600,000 souls; that the people of London are about 640,000, and one fourteenth part of the people of England. That in England and Wales are abou 10,000 parishes, and 25 millions of acres being about 4 acres to every head. That but 64 out of a hundred of the children born are living at 6 years old; but 40 at 16; but 25 at 26; but 16 at 36; but 10 at 46; but 6 at 56; but 3 at 66; but 1 at 76. And that London doubles itself in about 64 years.

Sir William Petty, in his discourse about duplicate proportion, says, that it is found by experience that there are more persons living between 16 and 26, than of any other age; and thence he infers, that the square roots of every number of men's ages under 16, shew the proportion of the probability of such persons reaching the age of 70. See the article LIFE.

Thus it is four times more likely, that one of 16 years of age lives to be 70, than a child of one year old; it is thrice as probable that one of 9 years lives to be 70, as such a new-born child, *&c.* That the odds is 5 to 4, that one of 25 dies before one of 16; and so on, as the square roots of the ages.

Dr. Hally has made a very exact estimate of the degrees of the mortality of mankind, from a curious table of the births and burials at the city of Breslau, the capital of Silesia, and an attempt to ascertain the price of annuities upon lives. See the article MORTALITY.

From the whole he makes the two following

lowing very good obfervations: 1. How unjuftly we ufe to complain of the fhortnefs of our lives; for that it appears that one half of thofe that are born, do not live above 17 years; and, 2. That the growth and increafe of mankind is not fo much ftinted by any thing in the nature of the fpecies, as it is from the curious difficulty moft people make of venturing on the ftate of marriage; and, therefore, that celibacy ought to be every way difcouraged by all wife governments; and thofe who have numerous families of children encouraged by good laws, fuch as the jus trium liberorum, *&c.* among the Romans.

POLITICS, the firft part of oeconomy, confifting in the well governing and regulating the affairs of a ftate, for the maintenance of the public fafety, order, tranquillity, and morals. See POLITY.

POLITIO, or POLIZZI, a town of Sicily, in the Val Demona, thirty miles eaft of Palermo.

POLITY, or POLICY, πολιτεια, denotes the peculiar form and conftitution of the government of any ftate or nation; or, the laws, orders, and regulations relating thereto.

Polity differs only from politics, as the theory from the practice of any art. See the articles LAW, GOVERNMENT, *&c.*

Some divide polity into agoranomy, or the regulations relating to mercantile affairs; and aftynomy, or thofe which concern the judiciary government of the citizens: fome add other branches, *viz.* thofe relating to ecclefiaftical and military affairs.

POLL, a word ufed in antient writings for the head: hence to poll, is either to vote or to enter down the names of thofe perfons who give in their votes at an election.

POLL-MONEY, a capitation or tax impofed by the authority of parliament on the head or perfon either of all indifferently, or according to fome known mark of diftinction.

POLLACK, in ichthyology, the name of two different fpecies of gadus; *viz.* the cole-fifh or raw-pollack, and the whiting-pollack. See the articles GADUS, COLE-FISH, and WHITING.

POLLARD, among hunters, a ftag which has caft his horns.

POLLARD, or POLLENGER, in agriculture, fignifies a tree that has been frequently polled, or lopped.

POLLEX, in anatomy, denotes either the thumb or great toe, according as either manus or pedis is added to it.

POLLICEPS, a fhell-fifh of the multivalve-kind, with a long, thin, and flefhy pedicle, fmaller at the bafe, and largeft at the top; on the fummit of which ftands the fhelly covering of the body of the animal, which is called a triton: this covering is compofed of a confiderable number of fhelly laminæ, of different fhapes and fizes; but altogether forming a triangular body, from the opening in the two fides of which the creature thrufts out its arms. See plate CCXLVI. ord. 3. which reprefents the bluifh polliceps, with the pedicle longer than the body: its flefhy covering confifts of an uncertain number of laminæ, all of a pyramidal figure, and fhut every exactly: the pedicle is of a brownifh-colour, and the fhelly part is a mixed bluifh, grey and white.

POLLING, among gardeners, the operation of fpreading the worm-cafts all over the walks, by means of long afh-poles; which is faid to be very beneficial to the grafs of the walks.

POLLUTION, in general, fignifies defilement, or the rendering a perfon or place unclean or unholy. For the jewifh pollutions, fee the article IMPURITY.

The romanifts hold a church to be polluted by the effufion of blood, or of feed therein; and require its being confecrated anew. And the Indians are fo fuperftitious on this head, that they break all the veffels which thofe of another religion have drank out of, or even only touched; and drain all the water out of a pond, in which a ftranger has bathed.

POLLUTION, in medicine, a difeafe which confifts in an involuntary emiffion of the feed in time of fleep. This, in different perfons, is very different in degree; fome being affected with it only once in a week, a fortnight, three weeks, or a month, and others being fubject to it almoft every night. The perfons moft fubject to it, are young men of a fanguineous temperament, who feed high and lead a fedentary life. When this happens to a perfon but once in a fortnight or a month, it is of no great confequence; but when it happens almoft every night, it greatly injures the health; the patient looks pale and fickly: in fome the eyes become weak and inflamed, are fometimes affected with violent defluctions, and are ufually at laft incircled with a livid appearance of the fkin. This diftemper is to be cured

rather

rather by a change of life than by medicines. When it has taken its rise from high diet, and a sedentary life, a coarser food and the use of exercise, will generally cure it; but if any medicines are to be given, nitre alone will do more than almost all the rest. This may be taken in large doses, a scruple at a time, with very little liquid with it, and must be continued for some time at night going to rest. The root of the water-lily, is greatly recommended by some in this case; and by others, the seeds of the agnus-castus; but it is very doubtful whether they have either of them any effect. Persons subject to this disease, should never take any stimulating purges, and must avoid as much as possible, all violent passions of the mind: and though exercise is recommended in moderation, yet if this be too violent, it will rather increase the disorder, than contribute to its cure.

POLLUX, in astronomy, a fixed star of the second magnitude in the constellation gemini, or the twins.

The same name is also given to the hindermost twin, or posterior part of the same constellation.

POLOCZK, the capital of the palatinate of the same name, in the dutchy of Lithuania, in Poland: east long. 29°, north lat. 56° 30′.

POLVERINE, in commerce, the ashes of the herb kali, preserved for the use of making glass. See GLASS and KALI.

POLYACANTHA, in botany, the same with the carduus, or thistle. See the article CARDUUS.

POLYADELPHIA, in botany, a class of plants, the eighteenth in order, whose stamina are connected together at their bases into several serieses.

The plants of this class, are subdivided into orders according to the number of their stamina: thus the polyadelphia pentandria, contain five stamina; and the polyadelphia icosandria and polyandria, contain twenty or more stamina.

POLYANDRIA, in botany, a class of plants, the thirteenth in order, with hermaphrodite flowers, and a large number of stamina, or male parts in each; these always exceed the number of twelve, and grow on the receptacle of the future seeds. The genera of this class being numerous, are arranged under different orders; the first of which is called polyandria monogynia, as containing only one style; the second, polyandria digynia, as having two styles; and so of the polyandria trigynia, tetragynia, pentagynia, &c. from their containing three, four, five, &c. styles.

POLYANTHEA, a collection of common places, in alphabetical order; for the use of orators, preachers, &c. See the article BOOK.

POLYANTHUS, in botany, a garden-flower of the primrose kind. The word is also used to denote any plant, which produces many flowers. See the article PRIMULA VERIS.

POLYCHREST, in pharmacy, a medicine that serves for many uses, or that cures many diseases.

Sal POLYCHREST, a compound salt made of equal parts of salt-petre and sulphur, laid on a red-hot crucible.

POLYCNEMUM, in botany, a genus of the triandria monogynia class of plants, the flower of which is composed of five petals, very like the leaves of the cup but shorter: the seed, which follows each flower, is single; and has scarce any covering, or at most only a very thin membrane.

POLYGALA, MILKWORT, in botany, a genus of the diadelphia decandria class of plants, with a papilionaceous flower: the fruit is a turbinato-cordated capsule.

A decoction of this plant, leaves and root together, being drank by nurses, is said to increase their milk; whence the name.

POLYGAMIA, in botany, a class of plants, the twenty-third in order, the characters of which are, that they have flowers of different structure; some having male-flowers, others female ones, and others hermaphrodite.

Of this class there are two orders, or subdivisions; whereof the first comprehends such polygamious plants, as contain the different kinds of flowers, on different parts of the same plant; and hence called polygamia monoecia: such are the musa, veratrum, celtis, parietaria, &c. The second order consists of such polygamious plants, as have their different flowers, not on the same individual plant, but on different plants of the same species: such are the chamærops, fraxinus, rhodiola, &c.

POLYGAMY, a plurality of wives or husbands, in the possession of one man or woman, at the same time.

Many arguments have been offered to prove the unlawfulness of polygamy, one

one of the principal of which is, that the males and females brought into the world, are nearly on a ballance; only abating for a ſmall exceſs on the ſide of the males, to make up for the extraordinary expence thereof, in war and at ſea: whence it evidently follows, that nature only intends one wife, or one huſband, for the ſame perſon: ſince if they have more, ſome muſt go without any at all. Hence it is juſtly concluded, that the chriſtian-law, which prohibits polygamy, is more agreeable to the law of nature than the mahometan, and we may add, than the jewiſh law, by which polygamy was tolerated. Yet Selden, in his Uxor Ebraica, ſays, that a plurality of wives was allowed of not only among the Hebrews, but among all other nations. The antient Romans, it is true, were more ſevere in their morals, and never practiſed it, though it was not forbidden among them; and Mark Anthony is mentioned as the firſt, who took the liberty of having two wives: but from that time, it became pretty frequent in the empire, till the reigns of Theodoſius, Honorius, and Arcadius, who firſt prohibited it in the year 393, by an expreſs law. After this, the emperor Valentinian by an edict, allowed all the ſubjects of the empire, the liberty of marrying ſeveral wives: and it does not appear from the hiſtory of thoſe times, that the biſhops made any oppoſition to this introduction of polygamy.

By the laws of England, polygamy is made felony, except in the caſe of abſence beyond the ſeas for ſeven years; and where the abſent perſon is living in England, Wales, or Scotland, and the other party has notice of it, ſuch marrying is felony by the ſtatute 1 Jac. I. c. 11.

POLYGLOTT, πολυγλοττος, among divines and critics, chiefly denotes a bible printed in ſeveral languages. In theſe editions of the holy ſcriptures, the text in each language is ranged in oppoſite columns. The firſt polyglott bible, was that of cardinal Ximenes printed in 1517, which contains the hebrew text, the chaldee paraphraſe on the pentateuch, the greek verſion of the LXX. and the antient latin verſion. After this, there were many others, as the bible of Juſtiniani, biſhop of Nebio, in hebrew, chaldee, greek, latin, and arabic; the pſalter by John Potken, in hebrew, greek, ethiopic, and latin; Plantin's polyglott bible, in hebrew, chaldee, greek, and latin, with the ſyriac verſion of the new teſtament; M. le Jay's bible in hebrew, ſamaritan, chaldee, greek, ſyriac, latin, and arabic; Walton's polyglott, which is a new edition of Le Jay's polyglott, more correct, extenſive, and perfect, with ſeveral new oriental verſions, and a large collection of various readings, &c.

POLYGON, in geometry, a figure with many ſides, or whoſe perimeter conſiſts of more than four ſides at leaſt: ſuch are the pentagon, hexagon, heptagon, &c. See PENTAGON, HEXAGON, &c.

Every polygon may be divided into as many triangles, as it has ſides: for if you aſſume a point, as *a*, pl. CCVII. fig. 2. n° 1. any where within the polygon, and from thence draw lines to every angle *a b*, *a c*, *a d*, &c. they ſhall make as many triangles as the figure has ſides. Thus, if the polygon hath ſix ſides (as in the figure above) the double of that is twelve, from whence take four, and there remains eight: I ſay that all the angles *b*, *c*, *d*, *e*, *f*, *g*, of that polygon, taken together, are equal to eight right angles. For the polygon, having ſix ſides, is divided into ſix triangles; and the three angles of each by 1. 32 Eucl. are equal to two right ones; ſo that all the angles together make twelve right ones: but each of theſe triangles hath one angle in the point *a*, and by it they complete the ſpace round the ſame point; and all the angles about a point are known to be equal to four right ones, wherefore thoſe four taken from twelve, leave eight the ſum of the right angles of the hexagon.

So it is plain the figure hath twice as many right angles, as it hath ſides, except four. *Q. E. D.*

Every polygon circumſcribed about a circle, is equal to a rectangled-triangle, one of whoſe legs ſhall be the radius of the circle, and the other the perimeter (or ſum of all the ſides) of the polygon. Hence every regular polygon is equal to a rectangled-triangle, one of whoſe legs is the perimeter of the polygon, and the other a perpendicular drawn from the center to one of the ſides of the polygon. And every polygon circumſcribed about a circle is bigger than it; and every polygon inſcribed is leſs than the circle, as is manifeſt, becauſe the thing containing is

is always greater than the thing contained. The perimeter of every polygon circumscribed about a circle is greater than the circumference of that circle, and the perimeter of every polygon inscribed is less. Hence a circle is equal to a right-angled triangle, whose base is the circumference of the circle, and its height the radius of it.

For this triangle will be less than any polygon circumscribed, and greater than any inscribed; because the circumference of the circle, which is the base of the triangle, is greater than the compass of any inscribed, therefore it will be equal to the circle. For, if this triangle be greater than any thing that is less than the circle, and less than any thing that is greater than the circle, it follows that it must be equal to the circle. This is called the quadrature or squaring of the circle; that is, to find a right-lined figure equal to a circle, upon a supposition that the basis given is equal to the circumference of the circle: but actually to find a right line equal to the circumference of a circle is not yet discovered geometrically. See the article CIRCLE.

Problems concerning POLYGONS. 1. On a regular polygon to circumscribe a circle, or to circumscribe a regular polygon upon a circle: bissect two of the angles of the given polygon A and B (*ibid.* n° 2.) by the right lines A F, B F; and on the point F, where they meet, with the radius A F, describe a circle, which will circumscribe the polygon. Next to circumscribe a polygon, divide 360 by the number of sides required, to find *e* F *d*; which set off from the center F, and draw the line *de*, on which construct the polygon as in the following problem. 2. On a given line to describe any given regular polygon: find the angle of the polygon in the table, and in E set off an angle equal thereto; then drawing E A=E D, through the points E, A, D, describe a circle, and in this applying the given right line as often as you can, the polygon will be described. 3. To find the sum of all the angles in any given regular polygon: multiply the number of sides by 180°; from the product subtract 360°, and the remainder is the sum required: thus, in a pentagon, $180\times5=900$, and $900-360=540$ the sum of all the angles in a pentagon. 4. To find the area of a regular polygon: multiply one side of the polygon by half the number of sides; and then multiply this product by a perpendicular, let fall from the center of the circumscribing circle, and the product will be the area required: thus, if A B (the side of a pentagon) $=54\times2\frac{1}{2}=135$, and 135×29 (the perpendicular) $=3915=$the area required. 5. To find the area of an irregular polygon, let it be resolved into triangles, and the sum of the areas of these will be the area of the polygon. See TRIANGLE, INSCRIBED, &c.

POLYGON, in fortification, denotes the figure of a town, or other fortress. See the article FORTIFICATION.

The exterior or external polygon is bounded by lines drawn from the point of each bastion, to the points of the adjacent bastions. See BASTION.

And the interior polygon, is formed by lines joining the centers of the bastions.

Line of Polygons, on the french sectors, is a line containing the homologous sides of the first nine regular polygons inscribed in the same circle; that is, from an equilateral triangle, to a dodecagon.

POLYGONAL NUMBERS, are so called, because the units whereof they consist may be disposed in such a manner, as to represent several regular polygons. See the article NUMBER.

The side of a polygonal number is the number of terms of the arithmetical progression that compose it; and the number of angles is that which shews how many angles that figure has, whence the pylygonal number takes its name.

To find a polygonal number, the side and number of its angles being given, the canon is this: the polygonal number is the semi-difference of the factums of the square of the side into the number of angles diminished by two units, and of the side itself into the number of angles diminished by four units.

The sums of polygonal numbers collected in the same manner as the polygonal numbers themselves are, out of arithmetical progressions, are called pyramidal numbers.

POLYGONATUM, SOLOMON'S SEAL, in botany, is ranked by Linnæus among the convallaria. See CONVALLARIA.

The root of this plant is a famous vulnerary; for being applied in form of a poultice, it not only heals fresh wounds, but takes away the marks of bruises, &c.

POLYGONUM, BISTORT. See the article BISTORT.

POLYGYNIA, among botanists, denotes an order or subdivision of a class of plants;

plants; comprehending such plants of that class, as have a great number of pistils, or female organs of generation. See PISTIL and GENERATION.

POLYHEDRON, in geometry, denotes a body or solid comprehended under many sides, or planes. See SOLID.

A gnomonic polyhedron is a stone with several faces, whereon are described various kinds of dials. See DIAL.

POLYHEDRON, POLYSCOPE, in optics, is a multiplying glass or lens, consisting of several plane surfaces disposed into a convex form. See the article LENS.

The phænomena of the polyhedron are as follow: 1. If several rays, as E F, A B, C D (plate CCVII. fig. 3. n° 1.) fall parallel on the surface of a polyhedron, they will continue parallel after refraction.

If then the polyhedron be supposed regular, L H, H I, I M, will be as tangents, cutting the spherical convex lens in F, B, and D; consequently, rays falling on the points of contact intersect the axis. Wherefore, since the rest are parallel to these, they also will mutually intersect each other in G.

Hence, if the eye be placed where parallel rays decussate, rays of the same object will be propagated to it still parallel from the several sides of the glass. Wherefore, since the crystalline humour, by its convexity, unites parallel rays, the rays will be united in as many different points of the retina, *a*, *b*, *c*, as the glass has sides.

Consequently, the eye, through a polyhedron, sees the object repeated as many times as there are sides: and hence, since rays coming from remote objects are parallel, a remote object is seen as often repeated through a polyhedron, as that has sides. 2. If rays, A B, A C, A D, *ibid.* n° 2. proceeding from a radiant point A, fall on several sides of a regular polyhedron; after refraction they will decussate in G, and proceed on a little diverging.

Hence, if the eye be placed where the rays coming from the several planes decussate, the rays will be propagated to it from the several planes a little diverging, i. e. as if they proceeded from different points. But since the crystalline humour, by its convexity, collects rays from several points into the same point; the rays will be united in as many different points of the retina, *a*, *b*, *c*, as the glass has sides; consequently, the eye, being placed in the focus G, will see even a near object repeated as often through the polyhedron, as that has sides. Thus may the images of objects be multiplied in a camera obscura, by placing a polyhedron at its aperture, and adding a convex lens at a due distance therefrom. And it really makes a very pleasant appearance, if a prism be applied so as the coloured rays of the sun refracted therefrom be received on the polyhedron: for by this means they will be thrown on a paper or wall near at hand in little lucid specks, much exceeding the brightness of any precious stone; and in the focus of the polyhedron, where the rays decussate (for in this experiment they are received on the convex side) will be a star of surprising lustre.

If images be painted in water-colours in the areolæ or little squares of a polyhedron, and the glass applied to the aperture of a camera obscura; the sun's rays, passing through it, will carry with them the images thereof, and project them on the opposite wall. This artifice bears a resemblance to that other, whereby an image on paper is projected on the camera, *viz.* by wetting the paper with oil, and straining it tight on a frame; then applying it to the aperture of the camera obscura, so as the rays of a candle may pass through it upon the polyhedron.

POLYHISTOR, a person of great and various erudition; whence

POLYMATHY, πολυμαθια, denotes the knowledge of many arts and sciences.

POLYMNIA, in botany, a genus of the syngenesia polygamia necessaria class of plants, the common calyx of which is a roundish perianthium, consisting of ten leaves; the compound flower is convex, with five female floscules in the radius; there is no pericarpium; the cup remains unchanged, the seed is single, oval, gibbous and naked.

POLYMYTHY, πολυμυθια, in poetry, a fault in an epic poem, when instead of a single mythos, or fable, there is a multiplicity of them.

POLYNOMIAL, or MULTINOMIAL, in algebra. See MULTINOMIAL.

POLYOPTRUM, in optics, a glass thro' which objects appear multiplied, but diminished.

POLYPE, or POLYPUS, in zoology, a small fresh-water insect of a cylindric figure, but variable, with very long tentacula. There is scarce an animal in the world more difficult to describe than this sur-

prising insect; it varies its whole figure at pleasure, and is frequently found beset with young in such a manner, as to appear ramose and divaricated; these young ones adhering to it in such a manner as to appear parts of its body.

When simple and in a moderate state as to contraction or dilatation, it is oblong, slender, pellucid, and of a pale-reddish colour: its body is somewhat smaller towards the tail, by which it affixes itself to some solid body; and larger towards the other extremity, where it has a large opening, which is the mouth, around which are the tentacula, which are eight in number, and one usually extended to about half the length of its body. By means of its tentacula, or arms, as they are commonly called, expanded into a circle of more than half a foot diameter, the creature feels every thing that can serve it for food; and seizing the prey with one of them, calls in the assistance of the others, if necessary, to conduct it to its mouth.

The production of its young is different from the common course of nature in other animals; for the young one issues from the side of its parent in the form of a small pimple, which lengthening every hour, becomes, in about two days, a perfect animal, and drops from off its parent to shift for itself: but before it does this, it has often another growing from its side; and sometimes a third from it, even before the first is separated from its parent; and what is very extraordinary is, that there has never yet been discovered among them any distinction of sex, or appearance of copulation; every individual of the whole species being prolific, and that as much if kept separate, as if suffered to live among others: but what is even still more surprising, is the reproduction of its several parts when cut off; for when cut into a number of separate pieces, it becomes in a day or two so many distinct and separate animals; each piece having the property of producing a head and tail, and the other organs necessary for life, and all the animal functions. There are several other species of this animal, most of which are found in our ditches. See plate CCVII, fig. 4. where n° 1. represents a cluster-polype, extending itself; and n° 2. is the same polype after being soaked in water, and the tentacula, or branches, laid straight.

Mr. Ellis endeavours to prove, that corallines, and other marine productions of the like kind, are only cases or coverings for marine polypes. See the article CORALLINE.

POLYPETALOUS, among botanists, an epithet applied to such flowers as consist of several petals, or flower-leaves. See the article FLOWER.

POLYPODIUM, POLYPODY, in botany, a genus of mosses, the fructifications of which are disposed in round spots on the under side of the disk of the leaf.

The polypodies are not branched, but consist of single leaves, divided almost to the middle rib into oblong jaggs, or segments. Both the root and leaves are used in medicine, being a gentle cathartic, and recommended in obstructions of the viscera.

POLYPREMUM, in botany, a genus of the tetrandria-monogynia class of plants, the calyx of which is a four-leafed, permanent, perianthium; the leaves are spear-shaped, keel-shaped, and coloured on the inside; the corolla consists of a single rotated petal, the fruit is an oval capsule, emarginated, compressed at the top, divided into two valves, and containing two cells, in which are a great many seeds.

POLYPUS, or POLYPUS *of the heart*, in medicine, a mass composed of various pellicles and fibres generated in the heart and large vessels.

Polypuses are generally found in acute as well as chronic diseases. Their principal seat is in the heart, pulmonary artery, and the aorta. They chiefly attack the sanguine constitutions, and such as have small vessels and soft fibres; those who are of a sedentary life, who drink little, or are free in the use of acid wines and spirituous liquors, or who eat great suppers.

The beginning of a polypus may be known by a compression of the breast, a fixed pain about the heart; and when it increases, there is a frequent palpitation of the heart, from very slight causes; the pulse is strangely unequal, and often intermits; on a violent motion of the body, or the patient's taking a medicine which disturbs the blood, or on the mind's being violently affected, there arises a shortness of breath, and an incredible anxiety of the heart. Lastly, there are frequent faintings, without any evident cause, or only from a certain position of the

the body; and if the blood is let fall into hot water, it will congeal like jelly, and cleave into white filaments.

A polvpus frequently produces the moft dreadful difeafes, and even fudden death. In the cure, an exact regimen and diet muft be made ufe of, with frequent exercife, and motions of the body. Etmuller fays, that when it proceeds from the fcurvy, or hyfteric affection, it is curable, and that the cure is to be attempted with chalybeate and coraline medicines, with cinnabar, volatiles, preparations of amber, and all antifpafmodics.

POLYPUSES *of the lungs*, are vifcous excretions of the fmall glands, formed in the deeper branches of the afpera arteria, and frequently miftaken for pieces of the blood-veffels or lungs.

POLYPUS *of the nofe*, a flefhy excrefcence, in the infide of the noftrils, which is of various fizes, and of different confiftencies; fometimes thefe excrefcences are foft, fometimes they are capable of elongation, and at other times they turn hard and rigid. In their beginning they are generally fmall, and advance gradually; fome are concealed within the nofe, and others hang out of that organ down to the lips, while others defcend backwards through the apertures by which we draw the air through the noftrils, and not only occafion great difficulty in fpeaking and fwallowing, but fometimes almoft ftrangle the patient. They are generally attended with pain; but fome, which are hard and livid, are extremely painful. They have generally but one root; but fometimes they have many.

Heifter mentions a method of extirpating a polypus, by conveying a ligature round its bafis, and tying it faft: but when the roots are inacceffible, he advifes taking hold of it with a crooked forceps, and twifting it till the roots are broken. If the flux of blood is not confiderable, the furgeon may fuffer it to continue till it ceafes of itfelf; but if it is profufe and dangerous, it is to be ftopped with doffils dipt in ftiptic liquors and powders, thruft up the noftrils. Mr. Le Dran cured a polypus of the nofe, which he could not extract wholly, in the following manner: he introduced one end of a large feton put on the point of the fore-finger of the left-hand into the patient's mouth, till he brought it behind the velum pendulum; then fliding a pair of thin crooked forceps into the affected noftrils, catched hold of the feton, after covering what was to be introduced into the nofe with a fuppurant medicine. While he drew the cord, he endeavoured to preferve the velum pendulum from being hurt, by introducing his fore-finger into the mouth, and fupporting the cord upon it. He continued the fuppurant till he was fenfible by the patient's breathing freely through the noftril, that the remains of the polypus were deftroyed, and then he injected deficcatives to cauterize the ulcer.

POLYPYRENEOUS, an appellation given to fruits, containing feveral kernels, or feeds.

POLYSCOPE, in optics, the fame with polyhedron. See POLYHEDRON.

POLYSPASTON, in mechanics, a machine confifting of an affemblage of feveral pullies; for the nature and force of which, fee the article PULLEY.

POLYSPERMOUS, among botanifts, fuch plants as have more feeds than four fucceeding each flower, without any certain order.

POLYSYLLABLE, in grammar, a word confifting of more fyllables than three; for when a word confifts of one, two, or three fyllables, it is called a monofyllable, diffyllable, and trifyllable.

POLYSYNDETON, in grammar and rhetoric, a figure whereby a redundance of conjunctions, efpecially copulative ones, is ufed; an example of which we have in the following verfe of Virgil.

Una eurufque notufque ruunt, creberque procellis africus.

POLYTHEISM, in matters of religion, the doctrine or belief of a plurality of gods. See the article GOD.

POLYTRICHUM, in botany, a genus of moffes, confifting of ftalks furnifhed with leaves, and producing feparate pedicles fupporting capfules; the pedicles always grow out of the extremities of the ftalks; the calyptræ are hairy; and the leaves in fome fpecies are rigid, in others foft.

POMADA, the exercife of vaulting the wooden horfe, by laying one hand over the pommel of the faddle.

POMATUM, an ointment made thus: Take of frefh hog's lard, three pounds; of the apples commonly called pome-waters, pared and fliced, one pound nine ounces; of the moft fragrant rofe-water, fix ounces; of florentine orrice-root, grofsly powdered, fix drams: let all thefe boil together in balneo mariæ, till the apples are diffolved; then ftrain without expreffion, and keep it for ufe.

Quincy

Quincy obferves, that the apples are of no fignificancy, and that the common pomatum is only lard beat into cream with rofe-water, and fcented with oil of lemons, thyme, or the like. Pomatums are alfo occafionally perfumed with the odours of jeffamines, oranges, jonquils, tuberofes, *&c.* They are principally ufed for pimples, and foulneffes of the fkin.

POMEGRANATE, *maluspunica*, in commerce, the fruit of a plant called by botanifts punica. See PUNICA.

This fruit does not much differ in its medicinal virtues from quinces, and is much ordered in decoctions againft gonorrhœas and fluxes, and often in aftringent clyfters; though it has but little fhare in the fhop-compofitions. The juice, which is reckoned much lefs aftringent than the fruit, is prefcribed in weakneffes of the ftomach and bowels, and removes naufeas, vomitings, and fluxes. it is reckoned alfo a good cooler in fome inflammatory fevers. Its ufe in the fhops is chiefly in the fyrup of mint.

Pomegranates on being imported, pay a duty of 7 s. $8\frac{40}{100}$d. the thoufand; and draw back, on exportation, 6 s. 9 d.

POMEIS, in heraldry, are green roundles, fo called by the englifh heralds, who give diftinct names to the different coloured roundles.

POMERANIA, a province of Upper Saxony, in the north of Germany; bounded by the Baltic-fea, on the north; by Poland, on the eaft; by another part of Poland and Brandenburg, on the fouth; and by the dutchy of Mecklenburg, on the weft.

POMIFEROUS, in botany, an appellation given to apple-bearing trees. See the article APPLE.

POMME', or POMMETTE', in heraldry, is a crofs with one or more balls or knobs at each of the ends.

POMMEL, or PUMMEL, in the manege, a piece of brafs, or other matter, at the top and in the middle of the faddle-bow.

POMMEL is alfo a round ball of filver, fteel, or the like, fixed at the end of the guard, or grafp of a fword, to ferve, in fome meafure, as a counterpoife.

POMPHOLYX, in the materia medica, a femi metallic recrement, very nearly allied in its nature to tutty; being a kind of flowers of zinc or calamine, fublimed higher than tutty, and carrying lefs of any metalline particles with it.

It is a white, light, and friable fubftance, found in thin cakes or crufts, adhering to the domes of furnaces, and covers of large crucibles, in which brafs is made either from a mixture of copper and lapis calaminaris, or of copper and zinc: it is found concreted alfo on the iron-rods, with which the workmen ftir the metal while melting.

The pompholyx, therefore, as it approaches to true flowers of zinc, or as it carries lefs of the copper in it, has all the deficcative and abftergent virtues of tutty, and is lefs acrimonious: it obtunds the fharpnefs of the humours in any part; it is better than tutty in collyriums and unguents for the eyes, and is excellent in cleanfing and drying old ulcers: it has alfo been given in intermitting fevers; but as there are many better medicines for thefe cafes, it might be more proper to ufe them.

POMUM, APPLE. See APPLE.

POMUM ADAMI, ADAM'S APPLE. See the article ADAMI *pomum*.

POND, or FISH-POND. See FISH-POND.

POND-WEED, *potamogeton*, in botany. See the article POTAMOGETON.

Water POND-WEED, a fpecies of perficaria. See the article PERSICARIA.

PONDESTURA, a town of Montferrat, in Italy, thirty-three miles eaft of Turin.

PONDICHERRY, a town of India, on the Coromandel-coaft, fixty miles fouth of Fort St. George: here the French have a factory, and a ftrong fort to defend it.

PONE, in law, a writ whereby a caufe depending in an inferior court, is removed into the king's bench, or common-pleas.

PONFERRADA, a city of Spain, thirty-eight miles fouth-weft of Leon.

PONIARD, a little pointed dagger, very fharp edged: it is now little ufed, except among affaffins.

PONS VAROLI, in anatomy, the upper part of a duct in the third ventricle of the brain. See the article BRAIN.

St. PONS, a town of Languedoc, twenty miles north of Narbonne.

PONTAFELLA, a town of Italy, twenty-five miles north of Friuli.

PONTAGE, a contribution towards the maintenance of bridges.

PONT A MOUSON, a town of Lorrain, fifteen miles north of Nancy.

PONT DE L'ARCHE, a town of Normandy, ten miles fouth of Rouen.

PONT D' ESPRIT, a town of Languedoc, forty-three miles north of Arles.

PONTE-

PONTEDERIA, in botany, a genus of the hexandria-monogynia claſs of plants, the flower of which conſiſts of a ſingle bilabiated petal; and its fruit is a trilocular, carnoſe capſule, of a triangular figure, containing a great many roundiſh ſeeds.

PONTEFRACT, a borough-town, eighteen miles ſouth-weſt of York. It ſends two members to parliament.

PONTESTURA, a town of Montferrat, ſix miles weſt of Caſal.

PONTIFEX, PONTIF, or HIGH PRIEST, a perſon who has the ſuperintendance and direction of divine worſhip, as the offering of ſacrifice and other religious ſolemnities. The Romans had a college of pontifs, and over theſe a ſovereign pontif, or pontifex maximus, inſtituted by Numa, whoſe function it was to preſcribe the ceremonies each god was to be worſhipped withal, compoſe the rituals, direct the veſtals, and for a good while to perform the buſineſs of augury, till, on ſome ſuperſtitious occaſion, he was prohibited intermeddling therewith. The office of the college of pontifs was to aſſiſt the high prieſt in giving judgment in all cauſes relating to religion, inquiring into the lives and manners of the inferior prieſts, and puniſhing them if they ſaw occaſion, &c. The Jews too had their pontifs; and among the romaniſts, the pope is ſtill ſtyled the ſovereign pontif.

PONTIFICATE, is uſed for the ſtate or dignity of a pontif, or high prieſt; but more particularly in modern writers, for the reign of a pope.

PONTON, or PONTOON, in war, denotes a little floating bridge made of boats and planks. The ponton is a machine conſiſting of two veſſels, at a little diſtance, joined by beams, with planks laid acroſs for the paſſage of the cavalry, the cannon, infantry, &c. over a river, or an arm of the ſea, &c. The late invented ponton is of copper furniſhed with an anchor, &c. to fix it. To make a bridge, ſeveral of theſe are diſpoſed two yards aſunder, with beams acroſs them; and over thoſe are put boards or planks. They are alſo linked to each other and faſtened on each ſide the river by a rope run through a ring in each of their heads, and fixed to a tree or ſtake on either ſhore: the whole makes one firm uniform bridge, over which a train of artillery may paſs. See BRIDGE.

PONTUS, the antient name of the countries ſituated on the ſouth ſide of the Euxine-ſea, now a part of Aſiatic Turky.

PONT VOLANT, flying bridge. See the article BRIDGE.

POOL, is properly a reſervoir of water ſupplied with ſprings, and diſcharging the overplus by ſluices, defenders, weirs, and other cauſeways.

Mill-POOL, a ſtock of water by whoſe force, &c. the motion of a mill is effected. See the article MILL.

Whirl-POOL. See WHIRL-POOL.

POOL, in geography, a borough and port-town of Dorſetſhire, ſituated on a bay of the engliſh channel, twenty miles eaſt of Dorcheſter: it ſends two members to parliament.

POOLOWAY, one of the Banda or nutmeg iſlands in the indian ocean: eaſt long. 128°, ſouth lat. 3° 30′.

POOP, *puppis*, the ſtern of a ſhip, or the higheſt, uppermoſt, and hinder part of the ſhip's hull. See the articles STERN and SHIP.

POOR, in law, an appellation given to all perſons who are in ſo low and mean a condition, as that they either are, or may become a burden to a pariſh.

Hence under the term poor, may be included thoſe who are ſo through impotency; as the aged, the blind, the lame, the fatherleſs and motherleſs, perſons labouring under ſickneſs, or who are idiots, lunatics, &c. for all whom the overſeers of the poor are obliged to provide.

There is alſo another kind of poor, on account of caſualties and misfortunes; as decayed houſe-keepers, and thoſe who have been ruined either by fire, water, robbery, or loſſes in trade, &c. all of whom, being able, are to be ſet to work, and otherwiſe relieved by the pariſh; and it is the ſame with reſpect to poor perſons overcharged with children, diſabled labourers, &c. As for vagabonds, ſtrumpets and other thriftleſs ſorts of poor, they may and ought to be ſent to houſes of correction, and put to hard labour, whereby they may be maintained: yet if even theſe fall ſick there, or their work is not ſufficient to maintain them, in that caſe there muſt be an allowance by the overſeers for their ſupport.

Before the reign of queen Elizabeth, we had few or no laws for the relief of the poor of this kingdom; but then a ſtatute was made enacting, that the church-

churchwardens of every parifh, and two or more houfholders are to be nominated and appointed yearly in eafter week by two juftices of the peace, as overfeers of the poor; which faid overfeers fhall meet once a month at the parifh church, there to confider of proper ways to relieve the poor, &c. And with the affent of the juftices they may make a rate on every inhabitant of the parifh, and occupier of lands, houfes, tithes; as alfo perfonal eftate, to raife a ftock for imploying of the poor, relieving the impotent, and others not able to work, the placing poor children out apprentices, and erecting cottages for poor perfons, &c. The overfeers are likewife to give a true account to two juftices within four days after the end of the year, or forfeit twenty fhillings, and where thefe officers are not appointed, the juftices incur five pounds penalty. 43 Eliz. c. 2. By this ftatute the father or grandfather, and mother or grandmother, or even children of poor impotent perfons, where they are of ability, are obliged to relieve fuch poor, according to fuch rates as juftices of peace in their feffions fhall appoint, under a penalty of twenty fhillings a month for every failure therein. *Ibid.*

It has been adjudged that a grandfather or father-in-law, that is married to the grandmother, or mother, is within this ftatute; and if the father of any children leaves the parifh, and there is a grandfather to be found, in cafe he is able to do it, it is faid he fhall be chargeable with the keeping of the children, and not the parifh where they are.

By a late act, the churchwardens and overfeers of the poor, where a wife or child is left upon a parifh, by perfons who have eftates or effects which might maintain them, on a warrant of two juftices, may feize the goods and receive the rents of the hufband or father, in order to fupport fuch wife or child. 5 Geo. 1. c. 8.

Every parifh is generally to keep and maintain its own poor; and in cafe any poor perfons demand relief, that are not parifhioners, they ought to be removed to their proper parifhes, and there be relieved; for that parifh the poor were laft legally fettled at, is deemed the place that fhall provide for them. And where perfons are removed, by warrant or order of juftices of peace, they fhall be received by the churchwardens and overfeers whither fent, on pain of forfeiting five pounds to the poor of the parifh whence conveyed, to be levied by diftrefs and fale of goods, &c. Neverthelefs a fick perfon fhould not be fent out of the parifh where he is, fo as farther to indanger his health; in which cafe, if the juftices grant a warrant to remove him, it will be a mifdemeanor in fuch juftices.

As to the fettlement, which entitles poor perfons to relief, it is acquired feveral ways, *viz.* on account of birth, in the cafe of baftards, vagrants, &c. by continuance of forty days in a parifh, after public notice given to overfeers, &c. or coming into a parifh and renting ten pounds a year eftate, or executing any public annual office, paying a fhare to the parifh taxes, &c. Alfo fervants acquire this title, by ferving a year in any parifh; and perfons bound apprentices: and tho' a perfon be only a lodger, it is held that his fervant may gain a fettlement by ferving a year in any parifh.

The wife of a perfon is to be fent to, and fettled with her hufband, even tho' he fhould be only a fervant; and as generally all children are to their parents.

It is however provided, that poor perfons fhall have the liberty to go to any parifh, by virtue of a certificate from churchwardens and overfeers, attefted by two witneffes, and fubfcribed by two juftices of peace, owning them to be parifhioners; and likewife agreeing, when they become chargeable, to receive them again.

It is alfo ordained, that there fhall be kept in every parifh a book, wherein the names of all fuch perfons, as receive any relief, fhall be regiftered, with the occafion thereof; and the parifhioners are once a year, or oftener, to have a meeting for that purpofe, when the faid lift fhall be examined into, by calling over the perfons, and inquiring into the reafons why they are relieved; and at this time a new lift muft be made of thofe thought fit to be allowed to receive collection; and the perfons thus receiving relief, ought to wear badges on their right fhoulders, alfo no others fhall have any benefit, unlefs by order under the hand of one juftice, &c. 3 & 4 W. & M. c. 11. And no juftice of peace fhall make any fuch order in behalf of any poor perfon, till oath is made of reafonable caufe for it, and that he was refufed to

to be relieved by the overseers, &c. And such person shall be registered in the parish books as other poor; nor may churchwardens and overseers bring to the parish account any money given to poor persons (except on sudden and emergent occasions) who are not registered, on pain of five pounds. The churchwardens and overseers of parishes are impowered to purchase or hire houses, and contract with persons, to maintain the poor, &c. who refusing to be so kept, shall be struck out of the parish books, &c. 9 Geo. 1. cap. 7. See 3 Geo. 2. c. 29.

For the manner of relieving poor prisoners, see the article PRISONER.

POOR, in ichthyology, a name given to the inch and a half gadus, with the anus in the middle of the body. See the article GADUS.

POPA MADRE, a town of Terra-Firma, in South America, situated on a high mountain, in west lon. 76°, north lat. 10° 15′.

POPAYAN, a province of South America, bounded by Terra-Firma, on the north; by New Granada, on the east; by Peru, on the south; and by the pacific ocean, on the west; situated between 75 and 80 degrees west longitude, and between the equator and 5 degrees of north latitude, being four hundred miles long, and about three hundred broad.

POPAYAN is also the capital of the province of Popayan, situated in west lon. 76°, north lat. 3°.

POPE, PAPA, the sovereign pontiff, or supreme head of the romish church. The appellation of pope was antiently given to all christian bishops, but about the latter end of the eleventh century, in the pontificate of Gregory VII. it was usurped by the bishop of Rome, whose peculiar title it has ever since continued. The spiritual monarchy of Rome sprung up soon after the declension of the roman empire. This sovereign is addressed under the term holiness, and in the council of the Lateran held under Innocent III. he was declared ordinary of ordinaries. The pope is an absolute monarch in his italian dominions, and his power is very considerable; being able, in case of necessity, to put fifty thousand men into the field, besides his naval strength in gallies. He is not only absolute in his own dominions, but issues his orders in ecclesiastical affairs, called briefs and bulls, throughout the catholic world. See the articles CONSISTORY, BULL, and BRIEF.

The pope is chosen by the cardinals out of their own body. See the articles CARDINAL, and CONCLAVE.

POPE, POPA, in roman antiquities, the name of an inferior priest, or minister employed in the sacrifices, whose office, it is said, was to bring the victim to the altar, to tie it, and cut its throat. The popæ went half naked, the sleeves of their garment being tied up, and the skirts short and gathered about the waist, that they might not be incommoded in slaughtering the victim: while doing their office, they were always crowned with a laurel.

POPE'S TERRITORIES, in Italy, are bounded by the Venetian territories, on the north; by the gulph of Venice, on the north-east; by Naples, on the south-east; by the Tuscan sea, on the south-west; and by the dutchy of Tuscany, on the north-west, almost encompassing that dutchy on the land side; being about two hundred and twenty miles long, and from twenty to one hundred and forty in breadth.

POPE, in ornithology, a species of alca, with four furrows on the beak, and with the sides of the head white. See ALCA. This is a very singular bird, somewhat larger than the widgeon; the head is large, and rounded; the eyes are small; the beak short; the toes are three, placed forward, and connected by a firm membrane; and the wings are very short, and composed of but few feathers, and not intended for high flights.

POPERINGEN, a town of the Austrian Netherlands, in the province of Flanders, situated five miles west of Ypres.

POPLAR, in botany. See POPULUS.

POPLES, in anatomy, the inner part of the juncture, whereby the thigh-bone is articulated with the tibia.

POPLITÆUS, in anatomy, a small muscle obliquely pyramidal, situated under the ham. It is fixed above by a strong narrow tendon, to the outer edge of the condyle of the inner os femoris, and to the neighbouring posterior ligament of the joint; from thence it runs obliquely downwards, under the inner condyle of the os femoris; its flat and pretty thick fleshy body increasing gradually in breadth, till it is fixed in the backside of the head of the tibia, all the way to the oblique line observable on that side.

POPLITEA, in anatomy, a name given to the third vein of the leg, arising from the

the heel, where it is formed out of feveral branches, coming both from the heel and ancle. It lies pretty deep in the flefh, and afcending up to the ham, terminates in the crural vein.

POPO, a territory of Guinea, in Africa, lying weft of Whidah.

POPPY, *papaver*, in botany, a genus of the polyandria-monogynia clafs of plants, the corolla whereof confifts of four-roundifh, plane, patent, large petals, narroweft at the bafe, and alternately fmaller: the fruit is a capfule containing one cell, coronated with a large plane ftigma, and opening with feveral foramina under it: the feeds are numerous and very fmall: the receptacles are longitudinal plicæ, of the fame number with the rays of the ftigmata; they grow to the fides of the fruit or capfule.

This is the plant which affords opium, for the virtues and preparations of which fee the article OPIUM.

POPULAR, *popularis*, fomething that relates to the common people.

POPULEUM, in pharmacy, an unguent prepared of the buds of black poplar, violet-leaves, navel-wort, and lard bruifed and macerated; to which are added bramble-tops, leaves of black poppies, mandragora, henbane, night-fhade, lettuce and burdock boiled in rofe-water and ftrained. It is much ufed as a cooler of burns, fcalds, and all forts of inflammations, alfo to affwage arthritic pains.

POPULUS, the poplar, in botany, a genus of the dioecia-octandria clafs of plants, the corolla of which has no flower petals. The nectarium is monophyllous, turbinated, and tubulated below; oblique above, and terminating in an oval limb: the fruit is a roundifh capfule, formed of two valves, and containing two cells, in each of which there is a number of roundifh pappofe feeds.

The buds of the poplar is ufed in the populeum, and the bark is detergent. The buds are alfo ufed by women in adorning and promoting the growth of their hair.

PORCAT, a port town of hither India, fituated on the coaft of Malabar, in eaft long. 75° 30′, north lat. 9°.

PORCELAIN, or PURCELAIN, a fine fort of earthen-ware, chiefly manufactured in China, and thence called china-ware. The moft juft idea we can form of the porcelain, or china-ware, is, that it is an half vitrified fubftance, or manufacture in a middle ftate between the common baked earthen-ware of our vulgar manufactures, and true glafs. This is the effential and diftinctive character of porcelain, and it is only by confidering it in this light, that we are to hope of arriving at the perfect art of imitating it in Europe. This attempt is to be made on thefe principles in two different manners: the one by finding fome appropriated matter, on which fire acts with more than ordinary ftrength, in the time of its paffing from the common baked ftate of earthen-ware into that of glafs. The other is to compofe a pafte of two fubftances, reduced to a powder, the one of which fhall be of force to refift a very violent fire, fo as not to become vitrified in it; and the other a matter very eafily vitrifiable. In the firft cafe, the matter is to be taken out of the fire at the time when it is imperfectly vitrified, and in the other, the compound mafs is to remain in the furnace, till the one fubftance which is the more eafily vitrifiable is truly vitrified; and being then taken out, the whole will be what porcelain is, a fubftance in part vitrified, but not wholly fo. The firft method is that by which the european porcelain has been generally made, which though it may be very beautiful, yet it is always eafy to diftinguifh even the fineft of it from the china-ware; and the nature of the two fubftances appears evidently different; thefe, owing all their beauty to their near approach to vitrification, are made to endure a long and violent fire, and are taken from it at a time when a little longer continuance fhould have made them perfect glafs: on the contrary, the china-ware being made of a pafte, part of which is made of a fubftance in itfelf fcarce poffible to be vitrified, bears the fire in a yet much more intenfe degree than ours, and is in no danger of running wholly into glafs from it.

The two fubftances ufed by the Chinefe, are well known by the names of petunfe and kaolin; and on examining thefe, it appears very evident, that we have in Europe the very fame fubftances, or at leaft fubftances of the very fame nature, capable of being wrought into porcelain equally beautiful and fine. See the articles KAOLIN and PETUNSE.

In making the chinefe porcelain, the firft preparation of the petunfe, is by breaking and reducing it into powder, rendered almoft impalpable by mallets, mortars

tars and mills; which, being thrown into a large urn full of water, they ftir brifkly about with an iron inftrument. After the water has refted a little while, they fkim off from the top a white fubftance formed there, and difpofe it in another veffel of water: they then ftir again the water of the firft urn, and again fkim it, and thus alternately till there remains nothing but the gravel of the petunfes at bottom, which they lay afrefh into the mill for a new powder. As to the fecond urn, wherein are put the fkimming of the firft, when the water is well fettled and become quite clear, they pour it off, and with the fediment collected at bottom in form of a pafte, fill a kind of moulds, whence, when almoft dry, they take it out, and cut it into fquare pieces, which are what they properly call fquare petunfes; referving them to be mixed with the kaolin in the proportion hereafter affigned. The preparation of the kaolin is the fame with that of the petunfes. Befides thefe two kinds of earths, there are as many kinds of oils, or varnifhes, ufed in the compofition of china-ware. The manner of preparing the firft oil is this: the petunfes being wafhed, undergo the fame operation as for making the fquares, excepting that the matter of the fecond urn is not put in moulds, but the fineft part of it taken to compofe the oil. To an hundred pounds of this matter they caft a mineral ftone, called fhekau; this ftone is firft heated red hot, and thus reduced in a mortar to an impalpable powder, and ferves to give the oil a confiftence, which however is ftill to be kept liquid. The oil of lime makes the fourth ingredient: the preparation whereof is more tedious and circumftantial. They firft diffolve quicklime, and reduce it to a powder, by fprinkling water on it: on this powder they lay a couch of dry fern, and on the fern another of flacked lime, and thus alternately till they have got a moderate pile; which done, they fet fire to the fern; the whole being confumed, they divide the afhes that remain on new couches of dry fern, fetting them on fire as before; and this they repeat five or fix times fucceffively, or even more: the oil being ftill the better as the afhes are oftener burnt. A quantity of thefe afhes of fern and lime are now thrown into an urn full of water, and to an hundred pounds of afhes is added a pound of fhekau, which diffolves therein. The reft being performed after the fame manner as in preparing the earth of the petunfes; the fediment found at the bottom of the fecond urn, and which is to be kept liquid, is what they call the oil of lime, and which gives the porcelain all its luftre.

In forming veffels of PORCELAIN, the firft thing is to purify the petunfe and kaolin, which for the firft, is done after the manner already defcribed in preparing the fquares; for the fecond it is fufficient to plunge it in an urn of water, in an open bafket, as it will eafily diffolve. The dregs that remain are perfectly ufelefs, and are emptied out of the work-houfe when a quantity is got together.

To make a juft mixture of petunfe and kaolin, regard muft be had to the finenefs of the porcelain to be made: for the finer porcelain they ufe equal quantities; four parts of kaolin to fix of petunfe for moderate ones; and never lefs than one of kaolin to three of petunfe for the coarfeft. The hardeft part of the work is the kneading and tewing the two earths together, which is done till the mafs be well mixed, and grow hard, by the workmen trampling it continually with their feet. Then being taken out of the bafons or pits wherein it is kneaded, it is done over a fecond time, but piecemeal, and with the hands, on large flates for that purpofe; and on this preparation it is, that the perfection of the work depends: the leaft heterogeneous body remaining in the matter, or the leaft vacuity that may be found in it, being enough to fpoil the whole. The porcelain is fafhioned or formed either with the wheel like our earthen-ware, or in moulds. See the article POTTERY.

Smooth pieces as urns, cups, difhes, *&c.* are made with the wheel; the reft fuch as are in relievo, as figures of men, animals, *&c.* are formed in moulds, but finifhed with the chiffel. The large pieces are made at two operations; one piece is raifed with the wheel by three or four workmen, who hold it till it have acquired its proper figure; which done, they apply to it the other half, which has been formed in the fame manner, uniting the two with porcelain earth made liquid by adding water to it; and polifhing the juncture with a kind of iron-fpatula. After the fame manner it is that they join the feveral pieces of porcelain formed in moulds, or by the hand, and

and that they add handles, &c, to the cups, and other works formed by the wheel. The moulds are made after the fame manner with thofe of our fculptors, *viz.* of divers pieces which feverally give their refpective figure to the feveral parts of the model to be reprefented, and which are afterwards united to form a mould for an intire figure. The earth they are made of is yellow, and fat. It is kneaded like potters-earth; and when fufficiently mellow, fine, and moderately dry, beating it ftoutly, they form it into moulds, according to the works required, either by hand, or on the wheel. See MOULD.

All the works that are made in moulds are finifhed by the hands with feveral inftruments proper to dig, fmooth, polifh, and to touch up the ftrokes that efcape the mould, fo that it is rather a work of fculpture than of pottery. There are fome works whereon relievos are added, ready made, as dragons, flowers, &c. others that have an impreffion in creux, which laft are engraved with a kind of puncheons. In general all porcelain-works are to be fheltered from the cold; their natural humidity making them liable to break when they dry unequally.

In the painting of PORCELAIN, it is obferved, that the chinefe painters, efpecially thofe that meddle with human figures, are all forry workmen; but it is otherwife with the colours they ufe, which are fo exceeding lively and brilliant, that there are little hopes our workmen will ever come to vie with them. The painting-work is diftributed among a great number of workmen in the fame laboratory; to one it belongs to form the coloured circle about the edges of the porcelain; another traces out flowers, which another paints: this is for waters and mountains alone; that for birds, and other animals; and a third for human figures.

There are porcelains made of all colours, both with regard to the grounds, and to the reprefentations thereon. As to the colour of landfcapes, &c. fome are fimple, fuch are all blues; others are mixed up with feveral tints; and others again are heightened with gold. The blue is made of lapis lazuli, prepared by burning it the fpace of twenty-four hours in a kiln, where it is buried up in gravel to the height of half a foot: when burnt, they reduce it into an impalpable powder in porcelain-mortars, not varnifhed, and with peftles of the fame matter. For the red they ufe copperas; a pound of this they put in a covered crucible, in the lid whereof is left a little aperture through which the matter on occafion may be feen. The crucible is heated with a reverberatory fire, till the black fmoke ceafes to afcend, and a fine one fucceeds it. A pound of copperas yields four ounces of red matter, which is found at the bottom of the crucible; though the fineft part is that ufually adhering to the lid and fides of the crucible. The powder of flints is likewife an ingredient in moft of the other colours, *e. g.* for green, to three ounces of fcoria of beaten copper, they ufe half an ounce of powder of flint, and an ounce of cerufe. Violet is made by adding a dofe of white to the green already prepared; the more green is added the deeper is the violet. For yellow they ufe feven drachms of white, and three of the copperas-red. Moft of thefe colours are covered up with gum-water, for application, with little faltpetre; fometimes cerufe or copperas, but more ufually copperas alone, being firft diffolved in the water. Indeed for porcelains that are to be quite red, the colour is ufually applied with oil, *i. e.* with the common oil of the porcelain; or another made of the white flints. There is another kind of red called blown red, becaufe in reality applied by blowing with a pipe, one of whofe orifices is covered with a very fine gauze: the bottom of this tube is lightly applied to the colour wherewith the gauze is fmeared, when blowing againft the porcelain it becomes all fprinkled over with little points. Black porcelain has likewife its beauty: this colour has a leady caft, and is ufually heightened with gold. It is made of three ounces of lapis lazuli, with feven of the common oil of ftone, though that proportion is varied as the colour is defigned to be more or lefs deep. The black is not given to the porcelain till it be dry, nor muft the work be put to the fire, till the colour be dry. The gold is not applied till after baking, and is rebaked in an oven for the purpofe. To apply gold they break and diffolve it in water, at the bottom of a veffel of porcelain, till a thin gilded cloud arifes on the furface; it is ufed with gum-water; and to give it a body they add three parts of cerufe or thirty of gold. There is likewife a kind of marbled porcelain, which is not made by applying the marblings with the

the pencil, but for oil to varnifh it withal; ufing that of white flints, which hatches and cuts the work with a thoufand humorous ftrokes, in manner of mofaic work. The colour this oil gives it is a white, fomewhat afhy. There are feveral other kinds of porcelain, but they are fuch as are rather for curiofity than ufe.

The feveral kinds of porcelains being quite painted, with their feveral colours, and all the colours dry, are to be polifhed, to prepare them to receive the oil, or varnifh, which is done with a pencil of very fine feathers, moiftened with water, and paffing lightly over to take off even the fmalleft inequalities. The oiling or varnifhing is the laft preparation of the porcelain, before it is carried to the oven: this is applied more or lefs thick, and feldomer or oftener repeated, according to the quality of the work: for thin fine porcelain, they give two very thin couches; to others one; but that one equivalent to the other two: there is a great deal of art in applying the varnifh, both that it be done equally, and not in too great a quantity. The couches in the infide are given by afperfion, and thofe on the outfide by immerfion. It muft be obferved, that the foot is not yet formed, but continues in a mere mafs, till the work has been varnifhed: it is at length finifhed on the wheel, and when hollowed, a little circle is pointed in it, and fometimes a chinefe letter. This painting being dry, the foot is varnifhed, and the work now carried to the oven to be baked.

In the baking or nealing of PORCELAIN, there are two kinds of ovens ufed; large ones for works that are only brought to the fire once; and fmall ones for fuch as require a double baking: the large ones are two chinefe fathoms deep, and almoft four wide: they are formed of a mixture of three earths; the fides and roofs are very thick; at the top of the dome, which is in form of a tunnel, is a large aperture to give vent to the flames and fmoke; befides which there are four or five fmall ones around, which, by being opened and fhut, ferve to augment and diminifh the heat. The hearth, which takes up the whole breadth of the oven, is placed in front againft the opening of the door, and is two or three feet deep, and two broad; people paffing over it on a plank to go into the furnace to range the porcelain. As foon as the fire is lighted, the door is walled up; only leaving an aperture for the conveyance of wood. Laftly, the bottom of the oven is covered with fand, wherein part of the firft porcelain cafes are buried. The oven itfelf is ufually placed at the extremity of a long narrow veftible, which ferves inftead of bellows; the air and wind being driven directly in the face of each oven.

Each piece of porcelain of any note, is difpofed in the furnace in its peculiar feparate cafe, but as to tea-difhes, &c. the fame cafe ferves for feveral. The cafes are all of the fame matter with the oven, they have no lids, but ferve each other mutually; the bottom of a fecond cafe fitting into the aperture of the firft, and thus fucceffively to the top of each column. Each cafe, which is ufually of a cylindrical form, that the fire may communicate itfelf more equably to the porcelains inclofed, has at bottom a little lay of fine fand covered over with duft of kaolin, that the fand may not ftick to the work; and care is taken that the porcelain may not touch the fides of the cafe. In the larger cafes, which hold the fmall pieces, they have the middle vacant, in regard porcelains placed there would want the neceffary heat. Each of thefe little pieces is mounted on a fmall maffive of earth, of the thicknefs of two crowns, covered with the powder of kaolin.

As faft as the cafes are filled, a workman ranges them in the cavity of the furnace; forming them into piles, or columns, whereof thofe in the middle are at leaft feven foot high; the two cafes at the bottom of each column are left empty, as in the uppermoft, as the fire has the leaft effect on them. In this manner is the whole cavity of the oven filled with columns; excepting that part precifely under the grand aperture. In ranging the cafes, they obferve to place the fineft piles of porcelain in the center; the coarfeft at the bottom; and thofe that are high-coloured, and confift of as much petunfe as kaolin, and wherein the worft oil is ufed, at the mouth. Thefe piles are all placed very near one another, and are bound together at top, at bottom, and in the middle, by pieces of earth, in fuch a manner as that the flame may have a free paffage among them, and infinuate equally on all fides. The oven muft never be fet altogether with new cafes, but half one, half

half the other, the old ones at the tops and bottoms of the pile, and the new ones in the middle. When the oven is filled, they wall up the door, only leaving a little aperture for the throwing in of little pieces of wood, to keep up the fire: it is then heated by degrees, for the ſpace of a day and a night. To know when the porcelain is baked enough, they open one of the leſſer holes of the oven, and with a pair of tongs take off the lid of one of the piles; if the fire appears very briſk and clean, and the piles equally inflamed, eſpecially if the colours of the porcelains that are uncovered, dart forth a noble luſtre, the coction is ſufficient: they diſcontinue the fire, and wall up what remained of the door of the furnace. If the oven be only filled with ſmall porcelain, they take them out twelve or fifteen hours after the fire is extinct; if it be filled with larger, they defer opening it for two or three days.

The Chineſe make another kind of porcelain which they paint and bake twice; and for this ſecond baking, they have a kind of little ovens on purpoſe. Theſe ovens, when very ſmall, are made of iron, or otherwiſe of a kind of bricks, made of the ſame earth with the porcelain caſes: the largeſt of theſe ovens does not exceed five foot in heigth, and three in diameter; and being much in the form of bee-hives, the bricks are arched a little to form the cavity the better. The porcelains here are not incloſed in caſes, as in the common ovens; the oven itſelf ſerving for that purpoſe, and being ſo exactly cloſed, that they receive no other impreſſions of the fire, but that of the heat of the charcoal, diſpoſed in the hearth at the bottom of the oven, as well as at top of the vault; and in the interval between the oven and the ſhell, or brick-wall. To prepare the porcelain for a ſecond baking, they muſt have had their varniſh in the common manner, and have paſſed the great oven: in this ſtate they are painted with various colours, after which, without giving them any new varniſh, they are ranged in piles in the little oven, ſetting the little ones over the larger, in form of pyramids. This ſecond baking is ſometimes intended to preſerve the luſtre of the colours the better, and at the ſame time to give them a kind of relievo; but more uſually its deſign is to hide defective places, by covering them over with colours: tho' the artifice is eaſily found out by paſſing the hand over them. When the workman judges his porcelain enough baked, he takes off the piece that covers the aperture, and if the works appear glittering, and the colours glowing, he takes out the charcoal; and when the oven is cold, the porcelain is ſo too.

The Saxons have now carried this manufacture the greateſt length of any other nation in Europe. Mr. Hanway tells us that, in order to preſerve this art as much as poſſible a ſecret among themſelves, the fabric at Meiſſen is rendered impenetrable to any but thoſe who are immediately employed about the work; and that the ſecret of mixing and preparing the materials is known to a very few of them, who are all confined as priſoners, and ſubject to be arreſted, if they go without the walls. It is with ſatisfaction, ſays that author, that I ſee the manufactories of Bow, Chelſea, and Stepney, have made ſuch a conſiderable progreſs in this manufacture. The French court ſeems to have very much at heart, the promotion of the new manufacture of porcelain, lately ſet up in the royal caſtle of Vincennes, with a view of equalling that of Saxony.

China-ware, for every 100 l. groſs value at the ſale pays, on importation, 34 l. 19 s. $7\frac{56\frac{1}{4}}{100}$ d. and, on exportation, draws back 32 l. 18 s. $7\frac{78}{100}$ d.

Glaſs PORCELAIN. See GLASS.

PORCELAIN SHELL, *porcellana*, in natural hiſtory, a genus of ſhell-fiſh, with a ſimple ſhell without any hinge, formed of one piece, and of a gibboſe figure on the back: the mouth is long, narrow, and dentated on each ſide; and the animal inhabitant is a limax.

To this genus belong the argus-ſhell and map-ſhell, ſo called from their ſpots and variegations; as alſo a multitude of other very elegant ſpecies. See plate CCVIII. fig. 1. where n° 1. repreſents the ſpecies, called the map-ſhell; n° 2. the argus-ſhell; and n° 3. two other ſpecies.

PORCH, in architecture, a kind of veſtible ſupported by columns; much uſed at the entrance of the antient temples, halls, churches, *&c.*

A porch, in the antient architecture, was a veſtible, or a diſpoſition of inſulated columns uſually crowned with a pediment, forming a covert place before the principal door of a temple, or court of juſtice. Such

Such is that before the door of St. Paul's Covent-Garden, the work of Inigo Jones. When a porch had four columns in front, it was called a tetraſtyle; when ſix, hexaſtyle; when eight, octoſtyle, *&c.* See the article TETRASTYLE, *&c.*

PORCUPINE, *hiſtrix*, in zoology, a very ſingular genus of quadrupeds, belonging to the order of the glires. See the article QUADRUPEDS.

The fore-teeth of the porcupine are obliquely truncated, and it has no canine teeth: its ears are of a figure approaching to round, and the body is covered with prickles, or ſpines, and alſo with briſtles, like thoſe of a hog. The ſpines or quills, as they are commonly called, are of two kinds; ſome being ſhorter, thicker, ſtronger, and more ſharp-pointed; and others longer, weaker, and more flexible: theſe laſt are a foot long, and compreſſed at the point. The ſpines of the firſt kind are white at the baſe, and of a duſky cheſnut-colour on the upper part; and the latter kind are white at each extremity, and variegated with black and white in the middle. This terrible covering makes the creature appear much larger than it really is: it ſomewhat reſembles the badger in ſhape; and its length, from the noſe to the tail, is about two feet. See plate CCV. fig. 7.

The porcupine above deſcribed, is the common european kind, with four toes on the fore-feet, and five on the hinder. But beſides this, there are ſeveral other ſpecies, diſtinguiſhed by the number of their toes; as the american porcupine, with four toes on each of its feet; the eaſt-india porcupine, with five toes on each of its feet, *&c.*

PORCUPINE-FISH, *hiſtrix.* See the article HISTRIX.

PORE, in anatomy, a little interſtice or ſpace between the parts of the ſkin, ſerving for perſpiration. See the articles CUTIS and PERSPIRATION.

The pores are moſt eaſily perceived in the hands and feet. In viewing the hand with a moderate glaſs, after its being well waſhed, we perceive innumerable little ridges of equal ſize and diſtance running parallel to each other, eſpecially on the tips and joints of the fingers, where they are regularly diſpoſed into ſpherical triangles and ellipſes: on theſe ridges, the pores are placed in even rows, and by a good eye may be diſcerned without a glaſs; but with one, every pore looks like a little fountain, in which the ſweat may be ſeen to riſe like clear rock-water. They are placed in the ridges, and not in the furrows between them, that they might be leſs able to be ſtopped by compreſſion; and on this account, the pores of the hands and feet are larger than the reſt.

PORELLA, in botany, a genus of moſſes, the anthera of which is multilocular and foraminoſe. See the article MOSS.

PORIA, a genus of funguſes, growing horizontally; but having its under ſide, not formed into lamellæ, but full of little holes or pores.

There are a great many ſpecies of poria, among which is the agaric of the ſhops. See AGARIC, and STYPTIC.

PORPESSE, in ichthyology, a ſpecies of the delphinus, with a coniform body, a broad back, and a ſubacute roſtrum: it is a very large fiſh, frequently confounded with the dolphin, from which it is different. See DELPHINUS and DOLPHIN.

PORPHYROGENITUS, in antiquity, an appellation given to the children of the eaſtern emperors, as being deſcended of parents who wore purple.

PORPHYRY, in natural hiſtory, a kind of ſtone of a plain uniform maſs, ſpotted with ſeparate concretions, of great hardneſs, giving fire with ſteel, not fermenting with acids, and very ſlowly and difficultly calcining in a ſtrong fire. See the article STONE.

Porphyry is of ſeveral ſorts, as 1. The porphyry of the antients, which is a moſt elegant maſs of an extremely firm and compact ſtructure, remarkably heavy and of a fine ſtrong purple, variegated more or leſs, with pale, red and white; its purple is of all degrees, from the claret-colour to that of the violet, and its variegations are rarely diſpoſed in veins, but ſpots, ſometimes very ſmall, and at others, running into large blotches. It is leſs fine than many of the ordinary marbles, but it excells them all in hardneſs, and is capable of a moſt elegant poliſh. It is ſtill found in immenſe ſtrata in Egypt. 2. The hard red-lead-coloured porphyry, variegated with black, white and green. This is a moſt beautiful and valuable ſubſtance. It has the hardneſs, and all the other characters of the oriental porphyry, and even greatly excels it in brightneſs, and in the beauty and variegation of its colours. It is found in great plenty in the iſland of Minorca, and is extremely worth importing,

porting, for it is greatly fuperior to all the italian marbles. 3. The hard, pale-red porphyry, variegated with black, white and green. This is of a pale flefh-colour; often approaching to white. It is variegated in blotches from half an inch to an inch broad. It takes a high polifh, and emulates all the qualities of the oriental porphyry. It is found in immenfe ftrata in Arabia Petræa, and in the Upper Egypt; and in feparate nodules in Germany, England and Ireland.

PORPHYRY-SHELL, a fpecies of the purpura. See the article PURPURA.

PORRACEOUS, in medicine, a term applied to the bile, fæces, &c. when their colour approaches to that of a leek.

PORRUM, the LEEK, in botany, a fpecies of allium, agreeing with the cepa, or onion, in medicinal virtues, being only accounted weaker. See the articles ALLIUM and CEPA.

PORT, a commodious place fituated on the fea-coaft, or at the mouth of a river, fcreened from the wind and the enterprizes of an enemy, with depth of water fufficient for fhips of burden, and where veffels lie by to load and unload.

Ports are either natural or artificial; the natural are thofe formed by providence, and the artificial fuch as are formed with moles running into the fea.

The city of Conftantinople is called the Port, from its having one of the fineft ports in Europe.

All the ports and havens in England are within the jurifdiction of the county; and the court of admiralty cannot hold jurifdiction of any thing done in them. 30 Hen. VI.

Bar-PORT, a port whofe entrance is ftopped up with a bar, or bank of fand, and can only be entered at high water, as that of Dublin.

Cinque PORTS. See CINQUE PORTS.

Clofe PORT, a port within the body of a city, as thofe of Venice, Rhodes, and Amfterdam.

Free-PORT, in commerce, a port in which merchants of all nations may load and unload their veffels, without paying any duties or cuftoms; as thofe of Leghorn, Genoa, &c.

The fame term is alfo ufed in a more limited fenfe for the fame privilege granted to a fet of merchants, with refpect to the goods they import, and thofe exported by them that are of the growth of the country. Such was the privilege the Englifh for feveral years enjoyed after their difcovery of the port of Archangel.

PORT is alfo ufed for the burden of a fhip. See the article BURDEN.

The capacity of a veffel is eftimated by tons, each of which may contain about two thoufand pounds weight of fea-water; but when it is faid that a veffel is of the port, or burden, of five hundred tons, it is not meant that it bears five hundred tons weight of merchandize, but that the water which would be contained in the fpace which the capacity of the veffel poffeffes in the fea, would weigh five hundred tons.

PORTS, in a fhip, the fame with port-holes. See the article PORT-HOLES.

PORT, among failors, denotes the larboard, or left fide of the fhip: thus to port a helm, is to put it on the left fide of the fhip, that the fhip may go to the right.

PORT is alfo a ftrong wine brought from Port-a-port, alfo called Porto and Oporto. See the article PORTO.

PORT *of the voice*, in mufic, the faculty or habit of making the fhakes, paffages, and diminutions in which the beauty of a fong or piece of mufic confifts.

PORT-CRAYON, a pencil-cafe, which is ufually four or five inches long, and contrived fo as that the pencil may flide up and down. Its infide is round, and its outfide is fometimes filed into eight fides or faces, on which are drawn the fector-lines: fometimes it is made round both withoutfide and within, and has its length divided into inches and parts of inches.

PORT CULLICE, or HERSE. See the article HERSE.

PORT-DIEU, among the French, is a parifh-prieft; fo called from his carrying the hoft to fick perfons.

PORTEN-BESSIN, a port-town of Normandy, in France, fituated on the Englifh-Channel: weft longitude 50′, north latitude 49° 20′.

PORT-GLAIVE, SWORD-BEARER, an order of knights in Poland, confirmed by pope Innocent III. and fent by him into Livonia, to defend the preachers of the gofpel againft the infidels, at the firft converfion of that country: but being too weak to accomplifh it, they united with the teutonic knights, and affumed the title of knights of the crofs.

PORT-GREVE, or PORT-GRAVE, was formerly the principal magiftrate of maritime towns. The chief magiftrate of London was antiently called by this name,

name, till Richard I. caused the city to be governed by two bailiffs, soon after which king John granted the city a mayor.

PORT-HOLES, in a ship, are the holes in the sides of the vessel, through which are put the muzzles of the great guns. These are shut up in storms to prevent the water from driving through them. The english, dutch, and french ships, have the valves, or casements, fastened at the top of the port-holes, and the spanish vessels aside of them.

PORT-LAST, the same with the gun-wale of a ship. See the article GUN-WALE.

The yard is down a-port-last, when it lies down on the deck.

PORT L'ORIENT, in geography, a fortress and port-town of Britany in France, at the mouth of the river Blavet: west long. 3° 15′, north lat. 47° 42′.

PORT-LOUIS, a port-town of Britany in France, situated in the bay of Biscay: west long. 3° 6′, north lat. 47° 42′.

PORT-MAHON, a port-town of the island of Minorca, situated on a fine bay at the east end of the island, in east long. 4° 6′, north. lat. 39° 50′.

PORT-MEN, a name given to the twelve burgesses of Ipswich.

PORT-MOTE, a court held in port-towns, as a swanimote in a forest.

Port-motes are also held in some inland towns, as at Knolst in Cheshire.

PORT-NAILS, such as are used to fasten the hinges to the ports of a ship.

PORT ROPES, in a ship. See the article ROPE.

PORT-ROYAL, the name of two monasteries of ciftercian nuns, in the diocese of Paris; the one near Chevreuse, at the distance of five leagues from Paris, called Port-Royal of the Fields, and the other in Paris, in the Suburbs of St. James.

The nuns of the former of these monasteries, proving refractory, were dispersed, when many ecclesiastics, and others, who were of the same sentiments as these religious, retired to Port-Royal, took apartments there, and printed many books: hence the name of Port-Royalists was given to all of their party, and their books were called books of Port-Royal: from hence we say the writers of Port-Royal, Messieurs de Port-Royal, and the translations and grammars of Port-Royal.

PORT-ROYAL, in geography, a port-town, situated in the extremity of a long point of land, in the south-east part of the island of Jamaica: west long. 77°, north lat. 17° 30′.

PORT-ROYAL, an island on the coast of South-Carolina, which, with the neighbouring continent, forms one of the most commodious harbours in the british plantations: west longitude 80°, north latitude 31° 45′.

PORT-ROYAL, in Acadia, the same with Annapolis. See ANNAPOLIS.

PORT ST. MARY'S, a port-town of Andalusia in Spain, ten miles north-east of Cadiz.

PORT-VENT, in an organ, is a wooden pipe which serves to convey the wind from the bellows to the sound-board. See the article ORGAN.

PORTA, or VENA PORTA, in anatomy, one of the three primary veins of the human body.

The vena-porta in its structure has some resemblance of a tree; the roots or inferior branches of which are divided into the right and left. From the right arise all the meseriac veins of the intestines, the internal hæmorrhoidal, and the right epiploics: and from the left, which is called the splenic vein, arise the gastric veins, which are various; and form the coronary vein of the stomach; the vasa brevia, the epiploic, and the gastro-epiploic veins; the pancreatic, and sometimes also the internal hæmorrhoidal vein. The trunk of the vena porta, which goes to the liver, affords the cystic veins, the right gastric, the duodenal, and this last often the pancreatic. In the branches, where the trunk begins to explicate, it constitutes the sinus-portæ in the liver; and from this it is divided into innumerable branches, which are dispersed through the whole substance of the liver.

PORTAIL, in architecture, the frontispiece of a church viewed on the side on which is the great door.

Portail is also used for the great door of a palace, castle, &c.

PORTAL, in architecture, a little gate where there are two gates of a different bigness; also a little square corner of a room cut off from the rest by the wainscot, and forming a short passage into the room. The same name is also sometimes given to a kind of arch of joiners work before a door.

PORTALEGRE, a city of Portugal, in the

the province of Alentejo, eighty miles east of Lisbon.

PORTATE, or a CROSS-PORTATE, in heraldry, a cross which does not stand upright, as crosses generally do, but lies across the escutcheon in bend, as if it were carried on a man's shoulders. See plate CCV. fig. 4.

PORTENTRU, a city of Switzerland, in the bishopric of Basil: east longitude 7°, north latitude 47° 30′.

PORTER, in the circuit of justices, an officer who carries a white rod before the justice in eyre, so called *a portando virgam*.

Groom-PORTER. See GROOM-PORTER.

PORTER is also a kind of malt-liquor, which differs from ale and pale-beer in its being made with high-dried malt. See the articles ALE and BEER.

PORTERAGE, a duty paid at the custom-house to those who attend at the water-side, and belong to the package-office.

There are tables hung up ascertaining the porterage for landing and shipping goods.

PORTICO, in architecture, a kind of gallery on the ground, supported by columns, where people walk under covert. Though this word is derived from *porta*, a gate or door, yet it is used for any disposition of columns which form a gallery.

PORTIO, PORTION, a part or division of any thing. Thus *portio dura*, and *portio mollis*, in anatomy, is a portion of the seventh pair of nerves of the brain. See the articles AUDITORY NERVES.

PORTION, in law, a part, or proportion, either of money given with a daughter, or of an inheritance.

PORTION, in the canon-law, is that proportion or allowance which a vicar receives out of a rectory or impropriation.

PORTIONER, is where a parsonage is served by two or more clergymen alternately, in which case the ministers are called portioners, because they have only their proportion of the tithes or profits of the living.

PORTLAND, a peninsula in Dorsetshire, situated in the English channel, ten miles south of Dorchester, famous for producing the best free-stone.

PORTLAND STONE is a dull whitish species of psadurium, much used in buildings about London: it is composed of a coarse grit, cemented together by an earthy spar: it will not strike fire with steel, but makes a violent effervescence with aqua-fortis. See FREE-STONE.

PORTMANTEAU, a cloak bag of cloth, leather, &c. in which the cloak, linen, and other habilaments of travellers are disposed and laid on the horse's crupper.

The same name is also given to a piece of joiner's work fastened to the wall in a wardrobe, armory, &c. proper for the hanging on of cloaks, hats, &c.

PORTMANTEAU, is also an officer under the king of France, of which there are twelve, whose business it is to keep the king's gloves, cane, sword, &c. to take them from him, and to bring them again when wanted. The dauphin has also his portmanteau, and the romish bishops their port-croix, port-mitres, &c. that is, their crozier-bearers, mitre-bearers, &c.

PORTO, or OPORTO, a city and port-town of Portugal, in the province of Entre-Minho-Douro: west longitude 9°, north latitude 41° 10′.

PORTO-BELLO, a port-town of America, situated on the narrowest part of the isthmus of Darien: west long. 82°, north lat. 10°.

PORTO-CAVALLO, or PORTO-CABELO, a port-town of Terra-Firma, in America, on the Caraccos-coast: west longitude 67° 30′, north latitude 10° 30′.

PORTO-FARINO, a port-town of Tunis, a little west of the ruins of Carthage: east longitude 9°, north latitude 36° 30′.

PORTO-FERAJO, a port-town on the north side of the isle of Elba, in the Tuscan Sea: east long. 11° 30′, north lat. 42° 35′.

PORTO-GALLETO, a port-town of the province of Biscay, in Spain, eight miles north of Bilboa.

PORTO-HERCOLE, a port-town of Tuscany, situated on a bay of the Tuscan Sea: east long. 12°, north lat. 42° 20′.

PORTO-LONGONE, a port-town on the east end of the isle of Elba, in the Tuscan-sea.

PORTO-RICO, an island in the american ocean, one hundred and twenty miles long, and sixty broad, which produces sugar, rum, and ginger: situated between 64° and 68° of west longitude, and in 8° of north lat. subject to Spain. The capital is also called Porto-Rico, and St John's city.

PORTO-SANTO, the least of the Madeira-islands, eighteen miles in circumference: west

weſt longitude 16°, north latitude 33°.

PORTO-VECCHIO, a port-town of the iſland of Corſica, forty miles north of Sardinia.

PORTO-VENERO, a port-town of Italy, in the territory of Genoa, forty-five miles ſouth eaſt of Genoa.

PORTRAIT, POURTRAIT, or POURTRAITURE, in painting, the repreſentation of a perſon, and eſpecially of a face done from the life.

In this ſenſe we uſe the term portrait-painting, in contradiſtinction to hiſtory-painting, where a reſemblance of perſon is uſually diſregarded. Portraits, when as large as the life, are uſually painted in oil-colours; ſometimes they are painted in miniature with water-colours, crayons, paſtils, *&c.*

PORTSMOUTH, a borough and port-town of Hampſhire, ſituated on a fine bay of the Engliſh channel; it has one of the moſt ſecure, capacious, and beſt fortified harbours in England: weſt long. 1° 6′, north lat. 50° 48′.

This town ſends two members to parliament.

PORTUGAL, the moſt weſterly kingdom in Europe; it is about three hundred miles long, and one hundred broad, and is ſituated between 7° and 10° of weſt longitude, and between 37° and 42° of north latitude; being bounded by Spain on the north and eaſt, and by the Atlantic ocean on the ſouth and weſt. This country is neither ſo hot nor ſo fruitful as Spain; it however produces plenty of grapes, olives, oranges and lemons.

PORTUGALLICA TERRA, *earth of Portugal,* in the materia medica, the name of a fine aſtringent bole, dug in great plenty in the northern parts of Portugal, and eſteemed a remedy againſt poiſons and venomous bites, and good in malignant fevers. Whatever may be its virtues of this kind, however, it is manifeſtly an aſtringent of the very firſt claſs, and is uſed with great ſucceſs in fluxes of all kinds. It is well known in ſome parts of the world, beſide the kingdom where it is produced; but is not known in the engliſh ſhops. The cheapneſs of our ſophiſticated bole-armenic, having excluded this whole valuable claſs of medicines from our practice. See the article BOLE.

The characters by which the portugueſe earth is known from the other red boles, are theſe: it is of a cloſe, compact, and regular texture, conſiderably heavy, and of a fine florid red, of a ſmooth and ſhining ſurface, eaſily breaking between the fingers, and a little ſtaining the hands. It adheres firmly to the tongue, melts freely and readily in the mouth, and has a ſtrongly aſtringent taſte, but leaves a little grittineſs between the teeth. It does not ferment with acids, and ſuffers ſcarce any change of colour in the fire.

PORTULACA, PURSLAIN, in botany. See the article PURSLAIN.

PORUS, in general, denotes a pore. See the article PORE.

PORUS BILARIUS, according to ſome, is the ſame with the hepatic duct; but others make a diſtinction between them, and obſerve, that the ductus hepaticus runs from the liver to the ductus choledocus; and that the branches of this diſtributed through the whole liver, make what are called the pori biliarii.

PORUS, in natural hiſtory, a name given by authors to a peculiar kind of foſſil coral, of which there are many different ſpecies; theſe are all of a beautifully laminated ſtructure, and ſeem allied to the mycetitæ or fungitæ; they are ſeldom found looſe, but uſually bedded in hard marble, and with their pores filled up with ſparry or mineral matter. See the article CORAL.

POSE′, in heraldry, denotes a lion, horſe, or other beaſt ſtanding ſtill, with all his four feet on the ground.

POSEGA, the capital of Sclavonia, ſituated on the river Orana: eaſt long. 18° 42′, north lat. 45° 35′.

POSEN, or BOLZANO, a town of Germany, in the circle of Auſtria, and biſhopric of Trent: eaſt long. 11° 20′, north lat. 46° 30′.

POSIDIUM, ποσειδεων, in antient chronology, the ſeventh month of the athenian year; which conſiſted of thirty days, anſwered to the latter part of December and beginning of January, and had its name from a feſtival in honour of Neptune Poſidonius kept in it.

POSITION, or SITUATION, in phyſics, an affection of place, which expreſſes the manner of any body's being therein. See the articles BODY and PLACE.

POSITION, in architecture, denotes the ſituation of a building with regard to the points of the horizon. Vitruvius directs the poſition of a building to be ſuch, as that the four corners point directly to the four cardinal winds.

Circles of POSITION. See CIRCLE.

POSITION, in dancing, the manner of difpofing the feet, with regard to each other. There are four regular pofitions: the firft is when the feet are joined in a line parallel to the fhoulders; the fecond, when the heels are perpendicularly under the fhoulders, and of confequence the width of the fhoulders apart; the third is when one foot is before the other, in fuch a manner as that the heel is in the cavity formed by the rotula and carpus of the foot; the fourth, when one foot is the width of the fhoulders apart from the other, the heel ftill anfwering to the cavity above-mentioned, which is the only regular manner of walking.

POSITION, or the *rule of falfe* POSITION, otherwife called the *rule of* FALSHOOD, in arithmetic, is a rule fo called, becaufe in calculating on feveral falfe numbers taken at random, as if they were the true ones, and from the differences found therein, the number fought is determined. This rule is either fingle or double. Single pofition, is when there happens in the propofition fome partition of numbers into parts proportional, in which cafe the queftion may be refolved at one operation, by this rule. Imagine a number at pleafure, and work therewith according to the tenor of the queftion, as if it were the true number: and what proportion there is between the falfe conclufion and the falfe proportion, fuch proportion the given number has to the number fought. See PROPORTION.

Therefore the number found by argumentation, fhall be the firft term of the rule of three; the fecond number fuppofed, the fecond term; and the given number, the third. See RULE *of Three*.

Or the refult is to be regulated by this proportion, *viz.* As the total arifing from the error to the true total, fo is the fuppofed part to the true one. Example, A, B and C defigning to buy a quantity of lead to the value of 140 l. agree that B fhall pay as much again as A, and C as much again as B; what then muft each pay?

Now fuppofe A to pay 10 l. then B muft pay 20 l. and C 40 l. the total of which is 70 l. but fhould be 140 l. Therefore, If 70 l. fhould be 140 l. what fhould 10 l. be?

Anfwer, 20 l. for A's fhare, which doubled makes 40 l. for B's fhare, and that again doubled gives 80 l. for C's fhare, the total of which is 140 l.

Double pofition, is when there can be no partition in the numbers to make a proportion. In this cafe, therefore, you muft make a fuppofition twice, proceeding therein according to the tenor of the queftion. If neither of the fuppofed numbers folve the proportion, obferve the errors, and whether they be greater or lefs than the fuppofition requires, and mark the errors accordingly with the fign + and —. See CHARACTER.

Then multiply contrarywife the one pofition by the other error, and if the errors be both too great, or both too little, fubtract the one product from the other, and divide the difference of the products by the difference of the errors. If the errors be unlike, as the one + and the other —, add the products, and divide the fum thereof by the fum of the errors added together: for the proportion of the errors is the fame with the proportion of the exceffes or defects of the numbers fuppofed to be the numbers fought: or the fuppofitions and their errors being placed as before, work by this proportion as a general rule, *viz.* as the difference of the errors if alike; or their fum, if unlike, to the difference of the fuppofitions, fo either error to a fourth number, which accordingly added to or fubtracted from the fuppofition againft it, will anfwer the queftion.

POSITION, in geometry, is a term fometimes ufed in contradiftinction to magnitude: thus a line is faid to be given in pofition, *pofitione data*, when its fituation, bearing, or direction, with regard to fome other line is given: on the contrary, a line is given in magnitude, when its length is given, but not its fituation.

POSITION is alfo ufed for a thefis or propofition maintained in the fchools. See the article THESIS.

POSITIVE, a term of relation fometimes oppofed to negative; hence a pofitive quantity, in algebra, is a real or affirmative quantity, or a quantity greater than nothing: thus called in oppofition to a privative or negative quantity, which is lefs than nothing, and marked by the fign —. Pofitive quantities are defigned by the character + prefixed or fuppofed to be prefixed to them. See NEGATIVE, QUANTITY, and CHARACTER.

POSITIVE is alfo ufed in oppofition to relative or arbitrary: thus we fay beauty

is no positive thing, but depends on the different tastes of people. See the article RELATIVE.

It is also used in opposition to natural: thus we say, a thing is of positive right, meaning that it is founded on a law which depends absolutely on the authority of him who made it. See the article NATURAL.

POSITIVE DEGREE, in grammar, is the adjective in its simple signification, without any comparison; or it is that termination of the adjective, which expresses itself simply, and absolutely, without comparing it with any other; thus, *durus*, hard, *mollis*, soft, &c. are in the positive degree: but *durior*, harder, and *mollior*, softer, &c. in the comparative degree; and *durissimus*, hardest, and *mollissimus*, softest, &c. in the superlative degree. See the articles COMPARATIVE and SUPERLATIVE.

POSITIVE, in music, denotes the little organ usually placed behind or at the feet of an organist, played with the same wind, and the same bellows, and consisting of the same number of pipes with the larger one, though those much smaller, and in a certain proportion: this is properly the choir-organ. See ORGAN.

POSSE COMITATUS, in law, signifies the power of the county, or the aid and assistance of all the knights, gentlemen, yeomen, labourers, servants, apprentices, &c. and all others within the county that are above the age of fifteen, except women, ecclesiastical persons, and such as are decrepit and infirm.

This posse comitatus is to be raised where a riot is committed, a possession kept upon a forcible entry, or any force of rescue used, contrary to the king's writ, or in opposition to the execution of justice; and it is the duty of all sheriffs to assist justices of the peace in the suppression of riots, &c. and to raise the posse comitatus, or to charge any number of men for that purpose.

POSSESSIO FRATRIS, in law, is where a man seised of lands in fee, having issue a son and a daughter by one wife, and a son by a second wife, dies; and the first son enters as heir to his father, and he also dies, without issue. In this case the daughter may enter, and shall have possession of the lands as heir to her brother. Yet if the eldest son happens to die, not having made an actual entry and seisin, the son by the second wife may enter as heir to his father, and shall enjoy the estate, and not the sister.

POSSESSION, in law, the holding or occupying of any thing, either de jure or de facto.

Possession de jure, is the title a man has to enjoy a thing, though it be usurped and in the actual possession of another; or where lands are descended to a person, and he has not yet entered into them: and possession de facto, or actual possession, is where there is an actual and effectual enjoyment of a thing. A long possession is much favoured by the law, as an argument of right, even though no deed can be shewn, and it is more regarded than an antient deed without possession. Thus annual possession gives a right to moveables; a triennial and peaceable possession of a benefice is sufficient to maintain it, provided it be founded on a plausible title; a possession of an estate for ten years by one present, and of twenty years by one absent, with a title, or of thirty years without any, gives a full right; but a centenary possession, which constitutes possession immemorial, is the best and most indisputable of all titles.

If he that is out of possession of land brings an action, he must prove an undeniable title to it; and when a person would recover any thing of another, it is not sufficient to destroy the title of the person in possession, without he can prove that his own right is better than his.

In order to make possession lawful upon an entry, the former possessor and his servants are to be removed from off the premises entered on: but a person by lease and release, is in possession without making any entry upon the lands. See ENTRY, DISSEISIN, INDUCTION, &c.

POSSESSIVE, in grammar, a term applied to pronouns which denote the enjoyment or possession of any thing, either in particular or in common: as *meus*, mine, and *tuus*, thine; *noster*, ours, and *vester*, yours. See the article PRONOUN.

POSSIBILITY, *possibilitas*, in law, is defined to be any thing that is altogether uncertain, or what may or may not be, and is taken to be either near or remote. A near possibility, is where an estate is limited to one after another's decease, whilst a remote possibility is something extraordinary that is never likely to come to pass.

The law does not regard a remote possibility, nor may any possibility, right, or choice in action, &c. be granted or

assigned

assigned to a stranger; though where it is founded on a trust it differs from a mere possibility, and therefore it is said to be devised by will, but the other cannot be so.

Possibility also denotes a non-repugnance to existing, in any thing that does not any way exist. See the articles Possible and Impossible.

This non-repugnance to existing, is no other than the producibility of any thing; which consists in this, that there are sufficient causes actually existing, or at least possible, whereby the thing may be produced, or be brought to exist, principally as there is a God, or an almighty cause; so that possibility does not imply any thing in the thing possible, but is a mere extrinsic denomination, taken from the power of the cause, and principally of God. In effect, if any createable thing had any intrinsic possibility, it would follow that such a thing must even exist without the cause; and yet we may allow an intrinsic possibility of a thing, if by possibility we do not understand its producibility, or its non-repugnance to exist, but only the non-repugnance of the attributes contained in its idea. But such possibility is merely logical.

POSSIBLE, *possibile*, is sometimes opposed to real existence, and understood of a thing which, though it does not actually exist, yet may exist; as a new star, another world, &c. which are particularly said to be physically possible. It is also opposed to impossible, in which sense it is applicable to any thing that does not contradict itself, or involve contradictory predicates, whether it actually exist or not, as a man, fire, &c. these are also said to be logically possible. See the article Impossible.

Possibles are reckoned to be threefold, *viz.* future, potential, and merely possible. Future possible, is that whose production is decreed and ascertained, *v. gr.* the futurition of all those events fixed by the immutable decree of the Almighty. Potential possible, is that which is contained, or lies hid, in its causes; as the tree in the seed, the fruit in the tree, &c. And mere possibility, is that which might exist, though it never shall.

Others distinguish possibles into metaphysical, physical, and ethical. Metaphysical possible, is that which may at least be brought to being by some supernatural and divine power, as the resurrection of the dead. Physical possible, is that which may be effected by a natural power, as to overturn the turkish empire: and ethical possible, is that which may be done by prudent persons, using all the proper means they have for the same.

POSSUM, or Opossum, in ichthyology. See the article Opossum.

POST, a courier or letter-carrier, or one who frequently changes horses, posted or placed on the road, for quicker dispatch. The word is also applied to the houses where such a person takes up and lays down his charge.

In England, posts were first established by act of parliament in the twelfth year of the reign of Charles II. which enabled the king to settle a post-office, and appoint a governor. The general post-office in Lombard-street, London, is now managed by two post-masters general, who have under them about forty other officers of their own appointing, as the receiver-general, accomptant-general, secretary, solicitor, resident and principal surveyor, comptroller, accomptant, clerk of the franks, six clerks of the several roads with their assistants, a window-man, and ten sorters for the inland office: besides which there are for the foreign office a receiver-general, an accomptant-general, a secretary, a comptroller, and alphabet-keeper, a solicitor, supervisor of the letter-carriers, six clerks, &c. and twenty-three letter-carriers.

On this grand office depend one hundred and eighty post-masters in England and Scotland, who keep regular offices for their several stages, and sub-post-masters in their branches; and such is the disposition of the stages, that there is no considerable market-town in England but has an easy and certain conveyance for letters to and from the said office in the due course of the mails every post.

For foreign intelligence in times of peace, Mondays and Thursdays are the post days to France, Spain and Italy: Tuesdays and Fridays for Holland, Germany, Denmark, and Sweden; on Mondays and Fridays the post also goes for Flanders, and from thence to Germany, Denmark, and Sweden; and on the last Thursday of every month a packet-boat sets outs from the Thames for Barbadoes, Montserrat, Nevis, St. Christopher's, Antego, and Jamaica. Letters are sent to all parts of England, Scotland, and Ireland, except Wales, on Tuesdays, Thurs-

Thursdays, and Saturdays, and are returned from all parts of England and Scotland every Monday, Wednesday, and Friday; from Wales, every Monday and Friday; and from Kent and the Downs, and a great many towns in other parts of England every day.

The charge of a letter of a sheet of paper eighty miles, is 3 d. of two sheets, 6 d. For above eighty miles, a sheet, 4 d. two, 8 d. An ounce of letters for eighty miles, 1 s. for above, 1 s. 6 d. &c. A single sheet from London to Edinburgh or Dublin, 6 d. &c.

The post travels at the rate of one hundred and twenty miles in twenty-four hours. And for those who choose to travel the post, horses are ready at the rate of 3 d. per mile, and 4 d. to the post-boy every stage.

The great mogul performs part of his postage by pigeons, kept in several places for the conveyance of letters upon extraordinary occasions, and these carry them from one end of that vast empire to the other. Tavernier observes, that at this day the consul of Alexandretta sends news daily to Aleppo, in five hours time by means of pigeons; though these places are distant three days journey on horseback.

Penny-POST, a post established for the benefit of London and the adjacent parts; by which any letter or parcel not exceeding sixteen ounces weight, or ten pounds value, is speedily conveyed to and from all parts within ten miles of London.

This office is managed by a comptroller; under whom are a collector, an accomptant, six sorters, eight sub-sorters, and sixty-nine messengers.

POST, in the military art, is any place or spot of ground fortified or not, where a body of men may make a stand and fortify themselves, or remain in a condition to fight an enemy. Hence it is said, that the post was relieved, the post was taken sword in hand, &c.

Advanced POST, is a spot of ground seized by a party to secure the army, and cover the posts that are behind.

POSTS, in building, large pieces of timber placed upright in houses. The posts framed into bressummers for strengthening the carcase of a house, are called prick-posts, and the corner posts are called the principal posts.

Burning a little the ends of the posts that are to be set into the ground, is said to be an excellent method to prevent them from rotting.

POSTS, in sculpture, are ornaments formed after the manner of rolls or wreathings; some of which are simple, and others enriched, or flourished.

POST, AFTER, a latin preposition used in composition with several english words, and generally implying a relation of posteriority. Thus post-diem, in law, is used where any writ is returned by the sheriff after the day assigned; for which neglect the custos brevium has fourpence. Post disseisin, is a writ which lies for a person who has recovered lands, &c. by præcepe quod reddat, upon default or reddition, is again disseised by the former disseisor. Post-fine, is a certain duty payable to the king for a fine formerly acknowledged in his court; paid by the cognizee after the fine is fully passed, and all things touching the same are accomplished. Post-term, or post-terminum, is a return of a writ not only after the day assigned for its return, but also after the term; on which the custos brevium has a fee of 20 d. This word is also used for the fee so taken.

POSTDAM, or POTSDAM, a town of Germany, in the marquisate of Brandenburg, ten miles south-west of Berlin.

POSTEA, in law, is the return of a record of the proceedings in a cause after a trial and verdict by writ of nisi prius, into the court of common pleas, after a verdict; and there afterwards recorded.

POSTERIOR, a term of relation implying something behind, or that comes after another, in which sense it is used in opposition to prior and anterior.

POSTERIORITY, in law, coming after, a term used in opposition to priority; as where a person holds lands or tenements of two lords, he is said to hold of his antienter lord by priority, and of his latter lord by posteriority.

POSTERN, in fortification, is a small gate generally made in the angle of the flank of a bastion, or in that of the curtin, or near the orillon, descending into the ditch; by which the garrison may march in and out unperceived by the enemy, either to relieve the works, or to make private sallies, &c.

POSTHUMOUS, a child born after the death of his father, or taken out of the body of a dead mother, from whence it is frequently applied to the works of an author not published till after his decease.

Among the Romans it was alfo ufed for a child born after the making of a will, which made it neceffary for the teftator to alter it.

POSTIL, a name antiently given to a note in the margin of the bible, and afterwards to one in any other book pofterior to the text.

POSTING, among merchants, the putting an account forward from one book to another, particularly from the journal or wafte-book to the ledger. See the article BOOK.

POSTIQUE, in architecture, an ornament of fculpture fuperadded after the work is done. A table of marble, or other matter, is alfo faid to be poftique, when it is incruftated in a decoration of architecture, *&c.*

POSTLIMINIUM, or POSTLIMINY, among the Romans, the return of one who had gone to fojourn elfewhere, or had been banifhed or taken by an enemy, to his own country and ftate.

POSTPONING, putting any thing after or behind another, with regard to time.

POSTSCRIPT, an article added to a letter or memoir, containing fomething learnt or recollected after the piece was written.

POSTULATE, *poftulatum*, in mathematics, *&c.* is defcribed to be fuch an eafy, and felf-evident fuppofition, as needs no explication or illuftration to render it intelligible; as, that a right line may be drawn from one point to another. That a circle may be defcribed on any center given, of any magnitude, *&c.* however, authors are not well agreed as to the fignification of the term poftulatum; fome make the difference between axioms and poftulata to be the fame as that between theorems and problems; axioms, according to thofe authors, being indemonftrable theoretical truths. But others will have it, that axioms are primitive and common to all things, partaking of the nature of quantity, and which therefore may become the objects of mathematical fcience: fuch as number, time, extenfion, weight, motion, *&c.* and that poftulata relate particularly to magnitudes, ftrictly fo called, as to things having local extenfion, fuch as lines, furfaces, and folids; fo that in this fenfe of the word poftulatum, Euclid, befides axioms, or thofe principles which are common to all kinds of quantities, has affumed certain poftulata to be granted him peculiar to extenfive magnitude. Hence feveral of the principles affumed in his elements, and ranked among the axioms by the moderns, are by Proclus ranked among the poftulata, which has induced Dr. Wallis to judge, that the laft of the two fenfes given to the term poftulatum is moft agreeable to the meaning of the antient geometers.

POSTULATION, *Poftulatio*, in the canonlaw, the nomination of a parfon to a dignity in the church, to which by the canons he cannot be elected, as for want of age, of birth, being already poffeffed of a benefice incompatible therewith, or the like impediment. Thus the formal election of fuch a parfon being faulty, they are obliged to proceed by way of poftulation, that is, the chapter befeeches the perfon to whom the confirmation of the election belongs to approve of it, though it be not canonical. See the article ELECTION.

POSTURE, in painting and fculpture, the fituation of a figure with regard to the eye, and of the feveral principal members thereof with regard to one another, whereby its action is expreffed. A confiderable part of the art of a painter, confifts in adjufting the poftures, in giving the moft agreeable poftures to his figures, in accommodating them to the characters of the refpective figures, and the part each has in the action, and in conducting and purfuing them throughout.

Poftures are either natural or artificial. Natural poftures are fuch as nature feems to have had a view to, in the mechanifm of the body, or rather fuch as the ordinary actions and occafions of life lead us to exhibit while young, and the joints, mufcles, ligaments, *&c.* are flexible. Artificial poftures, are thofe which fome extraordinary views, or ftudies, occafion us to learn: as thofe of dancing, fencing, *&c.*

POTABLE, *Potabilis*, fomething that may be fwallowed by way of drink.

POTAMOGETON, POND-WEED, in botany, a genus of the tetrandria-tetragynia clafs of plants, the corolla whereof confifts of four roundifh, obtufe, hollow, patent, and unguiculated petals: there is no pericarpium, the feeds are four in number, roundifh and accuminated, gibbous on one fide, and compreffed and angulated on the other. This plant has a refrigerating virtue, and is recommended in the cure of old ulcers.

POTANCE, in heraldry, a crofs like that reprefented in plate CCV. fig. 5.

POT-

POT-ASH, the lixivious-aſhes of certain vegetables, uſed in the making of glaſs, ſoap, &c. See GLASS, SOAP, &c.

The method of making pot-aſh is directed by Dr. Shaw, as follows. Burn a quantity of billet-wood to grey aſhes, and taking ſeveral pounds of theſe aſhes, boil them in water, ſo as to make a very ſtrong lixivium, or lye. Let this lye be ſtrained through a coarſe linen cloth, to keep out any black parts of the half-burnt wood, that might happen to remain in the aſhes: then evaporate this ſtrained lye in an iron-pan over a quick fire almoſt to dryneſs: then taking out the matter remaining at the bottom, and putting it into an iron-crucible, ſet it in a ſtrong fire till the matter is melted, and then immediately pour it out upon an iron-plate, where it ſoon cools, and appears in the form of a ſolid lump of pot-aſh. Much after this manner, is pot-aſh made in the large way of buſineſs, for the ſervice of the ſoap-boiler, and glaſs-maker, fuller, &c. but according to the difference of the wood, or combuſtible matter employed, with the manner of turning it, and conducting the proceſs, different kinds of pot-aſh are prepared. There are certain ſaline-plants that yield this pot-aſh to great advantage, as particularly the plant kali; there are others that afford it in leſs plenty, and of an inferior quality, as bean-ſtalks, &c. but in general, all vegetable ſubjects afford it of one kind or other, and may moſt of them be made to yield it tolerably perfect after the manner of the proceſs already laid down, even the lopings, roots, and refuſe parts of ordinary trees, vine clippings, &c. The fixed ſalts of all vegetables when reduced to abſolute purity, or intirely ſeparated from the other principles, appear to be one and the ſame thing: whence it ſhould ſeem, ſays Dr. Shaw, that by a ſuitable management, good ſaleable pot aſh might be made in all places, where vegetable matters abound. For if by examining Ruſſia pot-aſh, for example, we find that its ſuperior excellence depends upon its being clear of earth, or upon its containing a large proportion of oil, or fixed ſalt, theſe advantages may, by properly regulating the operation, be given to engliſh pot-aſhes, ſo as perhaps to render the latter as good as the former: but where the pot-aſh of any remarkable ſaline vegetable is to be imitated, that of the kali, for example, the doctor recommends a prudent ſprinkling of the ſubject with ſalt, or ſea-water, in the burning; and by theſe ways properly diverſified, any principle that is naturally wanting, might be artificially introduced ſo as to perfect the art of pot-aſh.

Two other methods of making pot-aſh have been publiſhed ſome years ago, in conſequence of an encouragement granted by parliament for that purpoſe, one by Mr. Thomas Stephens, and the other aſcribed to the late Sir Peter Warren.

Pot-aſhes the barrel containing two hundred weight, pay on importation 12 s. $3\frac{75}{100}$d. and draw back on exportation, 11s. $\frac{62\frac{1}{2}}{100}$d.

POTATOE, in botany, the engliſh name for a ſpecies of the tuberoſe-rooted ſolànum. See the article SOLANUM.

POTENT, or POTENCE, in heraldry, a term for a kind of a croſs, whoſe ends all terminate like the head of a crutch. It is otherwiſe called the jeruſalem croſs, and is repreſented in plate CCV. fig. 6.

POTENTIA, POWER, that whereby a thing is capable either of acting, or being acted upon. See POWER.

POTENTIAL, in the ſchools, is uſed to denote and diſtinguiſh a kind of qualities, which are ſuppoſed to exiſt in the body in potentia only, by which they are capable in ſome manner of affecting and impreſſing on us the ideas of ſuch qualities, though not actually inherent in themſelves; in which ſenſe we ſay, potential heat, potential cold. See the articles HEAT and COLD.

It is alſo uſed by ſchoolmen, for ſomething that has the quality of the genus. A potential whole, is that which has its parts under it as a genus has its ſpecies, to diſtinguiſh it from an actual whole, which has its parts in itſelf, as a body compoſed of matter and form.

POTENTIAL, in medicine. Cauteries are diſtinguiſhed into actual and potential. See the article CAUTERY.

POTENTIAL, in grammar, an epithet applied to one of the moods of verbs. The potential is the ſame in form with the ſubjunctive, and is according to Ruddiman implied in that mood, for which reaſon that grammarian rejects it: but others will have it to differ from the ſubjunctive in this, that it always implies in it either *poſſum*, *volo*, or *debeo*. It is ſometimes called the permiſſive mood, becauſe it often implies a permiſſion or con-

conceſſion to do a thing. See the articles MOOD, and SUBJUNCTIVE.

POTENTILLA, SILVER-WEED, WILD-TANSEY, or CINQUEFOIL, in botany, a genus of the icoſandria-pentagynia claſs of plants, the corolla whereof conſiſts of five roundiſh patent petals, inſerted by their ungues into the calyx: there is no pericarpium, the receptacle of the ſeeds is roundiſh, ſmall, and permanent, and is covered by the cup and ſurrounded with the ſeeds, which are numerous and acuminated.

This plant is ſaid to poſſeſs in a great meaſure the virtues of the peruvian bark; whence the expreſſed juice of it is much recommended in intermitting fevers: a decoction of it is of great uſe in the fluor albus, and the ſeeds and root of it are ſaid to cure a diarrhœa and hæmorrhage.

POTENZA, a city of Italy in the kingdom of Naples in the Baſilicate, ſituated in eaſt long. 16° 40′, north lat. 40° 40′.

POTERIUM, BURNET, in botany, a genus of the monoecia-polyandria claſs of plants, the corolla whereof is formed of a ſingle petal, divided into four roundiſh concave patent ſegments, growing together at the baſe: the fruit is a berry, the outer cruſt of which is formed of the indurated tube of the corolla; the ſeeds are two.

POTHOS, in botany, a genus of the gynandria-polyandria claſs of plants, the ſpatha of which is globoſe: the corolla conſiſts of four petals; and the fruit is a berry, containing ſeveral ſeeds.

POTION, *Potio*, a liquid medicine, conſiſting of as much as can be drank at one draught. The writers on pharmacy, diſtinguiſh potions into cathartic, cardiac, and alterative. See the articles CATHARTICS, &c.

POTOSI, a city of Peru in South America, ſituated at the bottom of a mountain of that name, in which is the richeſt ſilver-mine ever diſcovered: weſt long. 67°, ſouth lat. 22°.

POTTERY, the manufacture of earthen ware, or the art of making earthen veſſels.

The wheel and lathe are the chief, and almoſt the only inſtruments uſed in pottery: the firſt for large works, and the laſt for ſmall. The potters-wheel conſiſts principally in the nut, which is a beam or axis, whoſe foot or pivot plays perpendicularly on a free-ſtone ſole or bottom. From the four corners of this beam, which does not exceed two feet in height, ariſe four iron-bars, called the ſpokes of the wheel; which forming diagonal lines with the beam, deſcend, and are faſtened at bottom to the edges of a ſtrong wooden circle, four feet in diameter, perfectly like the felloes of a coach-wheel, except that it has neither axis nor radii, and is only joined to the beam, which ſerves it as an axis by the iron-bars. The top of the nut is flat, of a circular figure, and a foot in diameter: and on this is laid the clay which is to be turned and faſhioned. The wheel, thus diſpoſed, is encompaſſed with four ſides of four different pieces of wood faſtened on a wooden frame; the hind-piece, which is that on which the workman ſits, is made a little inclining towards the wheel; on the fore-piece are placed the prepared earth; on the ſide-pieces he reſts his feet, and theſe are made inclining, to give him more or leſs room. Having prepared the earth, the potter lays a round piece of it on the circular head of the nut, and ſitting down turns the wheel with his feet till it has got the proper velocity; then, wetting his hands with water, he preſſes his fiſt or his fingers-ends into the middle of the lump, and thus forms the cavity of the veſſel, continuing to widen it from the middle; and thus turning the inſide into form with one hand, while he proportions the outſide with the other, the wheel conſtantly turning all the while, and he wetting his hands from time to time. When the veſſel is too thick, he uſes a flat pieces of iron, ſomewhat ſharp on the edge, to pare off what is redundant; and when it is finiſhed, it is taken off from the circular head, by a wire paſſed underneath the veſſel.

The potters lathe is alſo a kind of wheel, but more ſimple and ſlight than the former; its three chief members are an iron-beam or axis three feet and a half high, and two feet and a half diameter, placed horizontally at the top of the beam, and ſerving to form the veſſel upon: and another larger wooden wheel, all of a piece, three inches thick, and two or three feet broad, faſtened to the ſame beam at the bottom, and parallel to the horizon. The beam or axis turns by a pivot at the bottom in an iron-ſtand. The workman gives the motion to the lathe with his feet, by puſhing the great wheel alternately with each foot, ſtill giving it a greater or leſſer degree of motion,

tion, as his work requires. They work with the lathe, with the ſame inſtruments, and after the ſame manner as with the wheel. The mouldings are formed by holding a piece of wood or iron cut in the form of the moulding to the veſſel, while the wheel is turning round; but the feet and handles are made by themſelves and ſet on with the hand; and if there be any ſculpture in the work, it is uſually done in wooden moulds, and ſtuck on piece by piece on the outſide of the veſſel. For the glazing of the work, ſee GLAZING.

For the chineſe POTTERY, ſee the article PORCELAIN.

POTTLE, an engliſh meaſure containing two quarts. See MEASURE.

POTTON, a market-town, ten miles eaſt of Bedford.

POULTICE, or POULTIS, a form of medicine alſo called a cataplaſm. See the article CATAPLASM.

POULTRY, all kinds of domeſtic birds brought up in yards, as cocks, hens, capons, ducks, turkeys, &c. For the method of producing theſe from eggs, without the aſſiſtance of the parent-bird, ſee the article HATCHING.

POUNCE, gum ſandaric pounded and ſifted very fine, to rub on paper, in order to preſerve it from ſinking, and to make it more fit to write upon.

POUNCE is alſo a little heap of charcoal duſt, incloſed in a piece of muſlin or ſome other open ſtuff, to be paſſed over holes pricked in a work, in order to mark the lines or deſigns thereof on paper, ſilk, &c. placed underneath; which are to be afterwards finiſhed with a pen and ink, a needle, or the like. This kind of pounce is much uſed by embroiderers, to transfer their patterns upon ſtuffs; by lace-makers, and ſometimes alſo by engravers.

POUNCES, in falconry, the talons or claws of a bird of prey. See FALCONRY.

POUND, *libra*, a ſtanding weight, for the proportion and ſubdiviſions of which, ſee the article WEIGHT.

POUND alſo denotes a money of account; ſo called, becauſe the antient pound of ſilver weighed a pound troy. See the article MONEY.

POUND, among lawyers, denotes a place of ſtrength, in which to keep cattle that are diſtrained, or put in for treſpaſs, until they are replevied or redeemed.

A pound overt, or open pound, is built on the lord's waſte, and the owner of the cattle may reſort thither to give them meat; whereas a pound covert, or cloſe pound, is one to which the owner cannot come to feed his cattle, without giving offence, as the diſtrainer's houſe, &c.

There is this difference between an open pound, and a cloſe one; that no notice is neceſſary to be given to the owner to feed them, when confined in an open or common pound; but when the cattle are impounded in a cloſe pound, the diſtrainer is to feed them at his peril.

A common pound is kept in every townſhip, lordſhip, or village; and it is ſaid, there ought to be the like in every pariſh, the want whereof is puniſhable in a court-leet.

Pound-breach is where a diſtreſs being impounded, the owner breaks the pound; in which caſe, whether the diſtreſs were juſt or not, the party diſtraining may have his action on the caſe by ſtatute, and alſo retake the diſtreſs wherever he can find it.

POUNDAGE, a ſubſidy of 12 d. in the pound, granted to the crown on all goods and merchandizes exported or imported; and if by aliens, one penny more.

POUP, or POOP, in a ſhip. See the articles POOP and SHIP.

POURPRESTURE, in law, is a wrongful incloſure, or encroachment upon another perſon's property.

POURSELUC, a city of the kingdom of Siam: eaſt long. 100°, north lat. 28°.

POURSUIVANT, or PURSUIVANT, in heraldry, the loweſt order of officers at arms. See COLLEGE and HERALD.

The pourſuivants are properly attendants on the heralds, when they marſhal public ceremonies. Of theſe in England, there were formerly many; but at preſent are only four, *viz.* blue-mantle, rouge-croſs, rouge-dragon, and portcullice. In Scotland, there is only one king at arms; who is ſtiled lion, and has no leſs than ſix heralds, and as many purſuivants, and a great many meſſengers at arms, under him.

POURTRAIT, or PORTRAIT. See the article PORTRAIT.

POURVEYANCE, or PURVEYANCE, in law, the providing corn, fuel, victuals, &c. for the king's houſhold; and hence, the officer, who did ſo, was termed pourveyor.

As ſeveral offences were committed by theſe officers, it was enacted by ſtat. 12

 Car.

Car. II. that no perſon under colour of purveyance, ſhall take any timber, cattle, corn, &c. from any ſubject without his free conſent, or without a juſt appraiſement, and paying for the ſame.

POUTING, a fiſh of the gadus-kind, with thirty rays in the fin beſide the anus.

POWDER, *pulvis*, in pharmacy, a dry medicine well broken, either in a mortar, by grinding, or by chemical operations. See the articles PULVIS and PULVERIZATION.

The jeſuits-powder is nothing but the quinquina, or peruvian bark reduced to powder. See QUINQUINA.

There are various other powders uſed in pharmacy, chemiſtry, &c. as algarot or emetic powder, cornachine powder, flux-powder, gun-powder, &c. See the articles ALGAROT, CORNACHINE, &c.

The powder of Haly, *pulvis Hali*, is a compound powder made of poppy-ſeeds, ten drams; of ſtarch, gum arabic, and tragacanth, each three drams; of the ſeeds of purſlain, marſhmallows, and mallows, each four drams; of cucumber, melon, gourd, citrul, and quince-ſeed, cleanſed, each ſeven drams; of liquorice, three drams; of white amber, two drams; and of ſugar-candy, the weight of the whole: make them all into a powder.

As this powder is apt to grow rancid, if long kept, it is much better in the form of lozenges. See LOZENGE.

It is intended as an emollient, and to ſoften and heal internal injuries; as diſorders of the breaſt, lungs and kidneys, ſpitting of blood, &c. It alſo cools the heat of urine in gonorrhœas and ſtranguries; its doſe being from half a dram to two drams.

A cephalic powder, as a ſternutatory, may be made of the leaves of aſarabacca, marjoram, and the lilies of the valley, each any quantity at pleaſure.

The various kinds of powders mentioned in books of pharmacy, being endleſs, we ſhall only give the form of a powder againſt miſcarriages: take red roſe leaves, maſtich, aloes-wood, pearls, red coral, of each a ſcruple; ſpikenard, mace, cinnamon, yellow ſaunders, cardamoms, and white amber, of each half a dram: reduce all to a powder. It is directed either in powder, from a ſcruple to a dram at a time, in red wine; or to be made into lozenges with their whole weight of ſugar, and a mucilage of tragacanth.

The beſt powder for the hair is ſtarch well pounded and ſifted, and generally prepared with ſome perfume.

POWDERINGS, among builders, certain devices, ſerving to fill up vacant places in carved works.

POWER, *potentia*, in phyſiology, the faculty of doing or ſuffering any thing.

Power therefore is two-fold, *viz.* conſidered as able to make, or able to receive any change, the former whereof may be called active power, and the latter paſſive power. Of paſſive power, all ſenſible things abundantly furniſh us with ideas, whoſe ſenſible qualities and beings we find to be in a continual flux, and therefore we look on them as liable to the ſame changes. Nor have we fewer inſtances of active power; ſince whatever change is obſerved, the mind muſt collect a power ſomewhere able to effect it; but, eſpecially, by reflecting on the operations of our own minds, as the power of perception, of volition, &c. See the articles FREEDOM, WILL, PERCEPTION, &c.

Dr. Keil demonſtrates that the phyſical power, or action of bodies, propagated in orbem: as light, heat, odour, &c. has its efficacy increaſed or diminiſhed in a duplicate ratio of the diſtances from the center of radiation, or exertion of that power.

Thus, let A (plate CCX. fig. 1.) be a center from whence any power is exerted all round, according to the right lines Ae, Af, Ag, &c. the efficacy of this power will be at equal diſtances from A, as the ſpiſſitude or denſity of the rays Ab, Ac, Ad, &c. But the rays within the inner circle, or rather ſpherical ſuperficies, bcdH, when they come to be extended to the other ſpherical ſurfaces, efgK, will be much leſs cloſe than before, *viz.* in the reciprocal proportion of the ſpaces they take up: and ſince ſpherical ſuperficies are as the ſquares of their radii, therefore the efficacy of the power, in the inner ſurface, will be to that in the outer, as Ae^2 to Ab^2. Q. E. D.

POWER, in mechanics, denotes any force, whether of a man, a horſe, a ſpring, the wind, water, &c. which being applied to a machine, tends to produce motion. See the articles MACHINE and ENGINE.

The intenſity of a power is its abſolute force; that is, its force, ſuppoſing its velocity equal to its weight: for its moving or acting force may be greater or leſs, according as its velocity is increaſed or

or diminiſhed, in reſpect of that of the weight. As for example, if a man be the power, and can raiſe from the ground a certain weight, that weight will expreſs or be equal to the intenſity of the power; for in this caſe, whatever engine be made uſe of, that part of the engine, where the weight is duly applied, will move juſt as faſt as that on which a man acts with his whole force.

A power may act in any direction whatever; but a weight has only one direction, *viz.* towards the center of the earth. See GRAVITATION.

When we ſpeak of the mechanical powers, the word power is taken in a very different ſenſe from that above laid down; ſince, in this caſe, it ſignifies only an organ or inſtrument, whereby a power of a known intenſity is made to act upon a weight: and therefore we muſt take care not to attribute any real force to any ſimple or compound machine, as many are apt to do merely becauſe the name power has been given to mechanical organs, not from their effect, but from the effect which the power produces by their means. For how much ſoever the force of a power is thereby increaſed, in order to ſuſtain or raiſe a weight far ſuperior to it in intenſity; yet this cannot be done without loſing in ſpace and time what is gained in force; contrary to what ſome have vainly imagined, becauſe the vulgar commonly ſpeak of a machine as they do of an animal; attributing that effect to the machine, which is only the effect of the power by means of the machine: thus, it is uſual to ſay, ſuch a machine raiſes ſuch a quantity of water, or performs ſuch and ſuch work; when we ſhould ſay, if we would ſpeak philoſophically, ſuch a running ſtream, ſuch a fall of water, the wind, or ſo many men, horſes, oxen, &c. raiſe ſo much water in ſuch a time, &c. by means of ſuch or ſuch a machine. It were therefore to be wiſhed, that the word power were to be confined to its proper ſenſe, and not uſed to ſignify one of the mechanical organs; however, as it has been cuſtomary to uſe it in that ſenſe, we have done ſo too, but withal thought proper to give the above caution.

The ſimple mechanical organs or powers are the lever, ballance, axis in peritrochio, pulley, ſcrew, wedge, and inclined plane. See the articles LEVER, BALLANCE, &c.

POWER, in law, ſignifies in general, a particular authority, granted by any perſon to another to repreſent him, or act in his ſtead. It is ſometimes alſo uſed for a reſervation in a conveyance, for the granter or grantee to do certain acts; as to make a jointure, to grant leaſes, &c. It is held, that the difference between a bare power and ſuch as ariſes from an intereſt, conſiſts in this, that a woman who has the former to ſell lands, &c. may do it notwithſtanding ſhe marries; but where it is by reſervation in a deed of ſettlement, ſhe muſt execute it according to the power at the time it was firſt reſerved.

For the power of the county, ſee the article POSSE COMITATUS.

In the feodal juriſprudence, the lord has a right to reunite to his fief, a dependent fee held of him, when the vaſſal has aliened the ſame; but then he muſt exerciſe this power within a year after he has notice of its fall, otherwiſe he loſes it.

POWERS, POTENTIÆ, likewiſe denote the ſixth order in the hierarchy of angels. See the article HIERARCHY.

POWERS, in arithmetic and algebra, are nothing but the products ariſing from the continual multiplication of a number, or quantity, into itſelf: thus, 2, 4, 8, 16, 32, &c. are the powers of the number 2; and a, a^2, a^3, a^4, &c. the powers of the quantity a; which operation is called involution. See the articles INVOLUTION and BINOMIAL.

Powers of the ſame quantity are multiplied by only adding their exponents, and making their ſum the exponent of the product: thus, $a^4 \times a^5 = a^{4+5} = a^9$. Again, the rule for dividing powers of the ſame quantity, is to ſubtract the exponents, and make the difference the exponent of the quotient: thus, $\frac{a^6}{a^4} = a^{6-4} = a^2$. See the article EXPONENT.

Negative powers, as well as poſitive, are multiplied by adding, and divided by ſubtracting their exponents, as above. And, in general, any poſitive power of a, multiplied by a negative power of a, of an equal exponent, gives unit for the product; for the poſitive and negative deſtroy each other, and the product is a^0, which is equal to unit. Likewiſe, $\frac{a^{-5}}{a^{-2}} = a^{-5+2} = a^{-3} = \frac{1}{a^3}$; and $\frac{a^{-2}}{a^{-5}} = a^{-2+5} = a^3 = \frac{1}{a^{-3}}$. And, in general, any quantity placed in the denomina-

minator of a fraction, may be transposed to the numerator, if the sign of its exponent be changed: thus, $\frac{1}{a^3}=a^{-3}$, and $\frac{1}{a^{-3}}=a^3$.

The quantity a^m expresses any power of a, in general; the exponent m being undetermined: and a^{-m} expresses $\frac{1}{a^m}$, or a negative power of a, of an equal exponent: and $a^m \times a^{-m}=a^{m-m}=a^0 = 1$. Again, a^n expresses any other power of a; and $a^m \times a^n = a^{m+n}$, and $\frac{a^m}{a^n}=a^{m-n}$.

To raise any simple quantity to its second, third, or fourth power, is to add its exponent twice, thrice, or four times to itself; so that the second power of any quantity is had by doubling its exponent; and the third, by tripling its exponent; and, in general, the power expressed by m, of any quantity, is had by multiplying the exponent by m: thus the second power, or square of a, is $a^{2\times 1}=a^2$; its third power, $a^{3\times 1}=a^3$; and the mth power of a, is $a^{m\times 1}=a^m$. Also the square of a^4, is $a^{2\times 4}=a^8$; the cube of a^4, is $a^{3\times 4}=a^{12}$; and the mth power of a^4, is $a^{4\times m}$. The square of abc, is $a^2\ b^2\ c^2$; its cube $a^3\ b^3\ c^3$; and the mth power, $a^m\ b^m\ c^m$.

POWER *of an hyperbola*, in conics, is the sixteenth part of the square of the conjugate axis; or the fourth part of the square of the semi-conjugate axis. See the article HYPERBOLA.

POX, or SMALL POX, *variolæ*, in medicine, a contagious disease appearing on the surface of the skin, which it covers with pustules, or ulcerous eruptions, that frequently leave scars behind them.

The small pox is commonly divided into two kinds, the distinct and the confluent. The distinct or regular sort, according to Sydenham, begins with a shuddering and chilness, which is succeeded by an intense heat, violent pain of the head and back, vomiting, drowsiness, and sometimes epileptic fits, especially in children, which shew the pox to be ready to burst forth, and that they will be mild. The eruptions are usually on the fourth day from the beginning, at which time the feverish symptoms either abate, or wholly disappear. The spots are at first reddish, and spread themselves over the neck, breast, and the whole body. On the eighth day the spaces between the pustules which were hitherto white, begin to grow red, and swell, the eye-lids are puffed up, and close the eyes; next to the face, the hands begin to swell; and the pustules of the face, before smooth and red, begin to be rough and whitish, and throw out a yellowish matter. On the eleventh day, the swelling of the face and inflammation disappear; and the pustules being ripe, grow dry and fall off: and on the fourteenth or fifteenth day, perish entirely. In the confluent sorts there are the same symptoms, but more violent; and as the disease increases, the eruptions do not arise to any considerable height: this sort is attended with spitting in adults, and generally with a looseness in children.

But though most authors, as we have already observed, divide the small pox into the distinct and confluent sorts; Dr. Mead thinks it more accurate, and agreeable to the nature of the disease, to divide it into simple and malignant. The simple sort is that in which the eruption is attended with a slight fever of short duration, the pustules fill kindly, make good matter in a few days, and at last fall off in dry scabs. The malignant sort is that in which the eruption is attended with a malignant fever, the pustules hardly come to any tolerable degree of maturity, and either suppurate not at all, or if they do in some measure, they are with difficulty brought to end in little crusts. The malignity appearing in various forms, has given various appellations to this disease, as the crystalline, the warty, and the bloody. The pustules of the crystalline sort, instead of a thick well-digested matter, contain nothing but a thin pale water, and are in some measure pellucid. And this sort is sometimes observed in the distinct as well as the confluent: sometimes this fluid flies off, and leaves hollow bladders. The warty pustules contain no fluid, but grow hard and prominent above the skin, like warts: these are peculiar to the distinct sort. The bloody pustules are produced more ways than one; for sometimes, at the very beginning of the disease, the pustules are small tubercles full of blackish blood, as if the skin was pinched with a forceps; then purple and livid spots follow, as in the true plague: but it more frequently happens,

pens,

pens, that the pustules coming out very thick, on the third or fourth day after, when they ought to fill, become livid and a little bloody, with black spots spread over the whole body, which forebode death in a day or two, these being real gangrenes. It very often falls out at this time, that a thin blood flows not only out of the patient's mouth, nose, and eyes, but also by every outlet of the body, but more especially by the urinary passages, as it does sometimes on the first days of the distemper: these are manifestly of the confluent kind.

In the management of the patient, in the distinct sort, it is a general rule, says Dr. Mead, to keep the patient in bed during the first days of the distemper, but neither to stifle him by heat and cloaths, nor to check the perspiration by cold; yet care ought to be taken to supply him with pure and cool air. With regard to diet, it ought to be very slender, moistening and cooling, such as oatmeal or barley gruel; and in the beginning, the best regimen is that which keeps the body open, and promotes urine: this end is obtained by boiling preserved fruit with their food, and giving them subacid liquors for drink, as small beer acidulated with orange or lemon juice, whey turned with apples boiled in milk, &c.

In the cure, Sydenham advises bleeding on any of the three first days, and then an ounce or an ounce and an half of emetic wine. Mead also, in the first place, advises bleeding even to children, and affirms that when they are seized with convulsions at the onset of the disease, some evacuation ought to be made, which may be safely done by leeches applied to the temples, or behind the ears, and that in most young subjects, if blood cannot be drawn from the arm, either of the jugulars may be opened. In youths and adults, he says, it is often necessary to take away blood two or three times, only with an intermission of two or three days between each time; for blood-letting is so far from being an obstacle to the eruption of the pustules, if the patient is not too weak, that it forwards it considerably. He adds, that after bleeding, a vomit should be given, if the stomach abound with phlegm or bile, or be loaded with food unseasonably taken: otherwise a purge may be prescribed before the eruption of the pustules, which may be the infusion of sena with manna, or manna alone, especially for children. To keep the inflammation of the blood within due bounds, and to assist the expulsion of the morbific matter through the skin, take half an ounce of bezoardic powder, and two drams of purified nitre; mix these powders: half a dram of this mixture may be taken by an adult three or four times in a day; diminishing the quantity for children according to their age. Sometimes equal quanities of these ingredients may be prescribed; and if the effervescence of the fever runs very high, a proper quantity of the spirit of vitriol may be added to the patient's drink. When the eruption of the pustules is completed, an adult patient may take about fourteen drops of liquid laudanum, or an ounce of syrup of white poppies, in a little cowslip-flower-water, every night. But opiates are improper for children.

If this method is proper in the distinct small pox, it will be found more necessary in the confluent. In the crystalline sort, the water of the pustules can never be brought to a laudable suppuration; therefore, while the thinner parts are made to transpire through the skin, the grosser ought to be drawn off through the urinary passages. To this purpose nitre may be administered three or four times a day, from a scruple to half a dram, in small wine; and while nitre is thus taken, it will be proper to interpose medicines which cherish the heart, and promote the flux of the humours into the pustules, as the cordial confection, or the bezoardic powder, sometimes with a little saffron. Besides, on the fifth or sixth day, blisters are to be applied between the shoulders, and to the arms and legs; for which purpose the blistering epithem is most convenient. In the warty small pox, which is more dangerous than the crystalline, the utmost endeavours are to be used to take off the fever, and to provoke a sweat, in order to digest the morbid humour, by the cordial medicines abovementioned; and, in this case, blisters are likewise to be applied. The bloody small pox requires peculiar attention; and Mead observes, that if there be any room for physic, those medicines bid fairest for success, which tend to thicken the blood: the best of this kind are the peruvian bark, alum, and oil of vitriol; which are best used alternately in this manner, a dram of the bark may be given every sixth hour, and three hours after a proper quantity of alum; which will be a powerful medicine, if thus compounded,

ed, melt three parts of alum with one part of dragon's blood, over the fire; and when the mass is grown cold, reduce it to a powder: a scruple of this, made into a bolus with oil of roses, will be a proper dose. The most convenient manner of giving the oil of vitriol, is in the tincture of roses; of which tincture five or six spoonfuls may be taken four or five times a day. In every sort of this disease, it is proper to open the body on the decline, that is, on the ninth or tenth day from the eruption; because a putrid fever generally comes on about that time, while the pustules are drying; or upon the subsiding of the swelling of the inflamed skin, where there is no suppuration; gentle cathartics are the safest means of removing this fever, and such as were directed before the eruption: but if any purulent matter should still lurk under the withered skin of the pustules, the body is not yet to be purged, but rather to be supported by the proper diet, till the matter is all come away.

French POX, *lues venerea*, is defined a malignant and putredinous dyscrasy of all the humours, but especially of the serum and lymph, arising from a venereal taint received into the body; or, according to Sydenham, when a gonorrhœa has continued a long while, or long enough for the poisonous matter to make its way into the blood; or by astringents given unseasonably, it cannot make its exit, then the patient is infected with the french pox. See the article GONORRHOEA.

The buboes in the groin constitute the first degree of this distemper: then follow pains of the head, joints, of the shoulders, arms, and ancles, coming on by fits, but at no certain intervals, unless in the night, when the patient is warm in bed. See the article BUBO.

There are also scabs and scurfs in various parts of the body, which are as yellow as a honeycomb; sometimes they have large surfaces, answering the description which authors give of the leprosy. All these symptoms gradually increase, especially the pain, which becomes so intense that the patient is unable to lie in bed. Afterwards, nodes or exostoses arise in the skull, shin-bones, and bones of the arms, which being attended with constant pain and inflammation, at length grow carious and putrefied. Phagedenic ulcers likewise seize various parts of the body, but generally first begin with the throat, and from thence gradually creep by the palate to the cartilage of the nose, which they destroy, and the nose being destitute of its prop, falls down flat. The ulcers and pains daily increasing, the patient sinks under the torment, and one member rotting away after another, is hurried into his grave.

Besides these already mentioned by Sydenham, Astruc enumerates a large catalogue of symptoms that afflict the skin, the mouth, the throat, uvula, tonsils, the bones, the lymph, the lymphatic glands and vessels, the eyes, ears, *&c.* See the articles SERPIGO, HERPES, CARIES, APHTHÆ, EXOSTOSIS, GANGLION, *&c.*

Women afflicted with this distemper, have disorders proper to the sex, as cancers in the breast, a suppression or overflowing of the menses, the whites, the hysteric passion, an inflammation, abscess, schirrus, gangrene, ulcer, and cancer of the womb: they are either barren, or subject to abortion, or the children they bring into the world have an universal erysipelas, half rotten, and covered with ulcers. See the articles MENSES, WHITES, HYSTERIC PASSION, *&c.*

The methods of curing the french pox are principally four: 1. The common one, by salivation. 2. By giving quicksilver-pills. 3. By mercurial frictions, which are to be purged off before a salivation is raised. And, 4. By sweating, with a decoction of guaiacum. For the first, of these methods, see SALIVATION.

The second method of curing the french pox is by a quicksilver-pill. This was brought into reputation by Belloste; and, tho' he has kept the composition a secret, yet there is no reason to doubt but it is quicksilver mixed with a certain proportion of cathartic. Turner's imitation of this pill is as follows: take of quicksilver, two drams; turpentine, and pill of calocynth with aloes, of each half a dram; of which make twelve pills. The quicksilver must be well incorporated with the turpentine till it becomes invisible; and then the pill of calocynth with aloes is to be added: sometimes it will require a little crab's eyes, to give it a consistence. If one of these pills be taken night and morning, after the two first days, it will give two or three stools a day, without gripes or sicknefs. It may be proper, either night or morning, after the pill, to sweat the patient with a pint of the strong decoction

tion of guaiacum, drank hot upon it. In the middle ſpecies of this diſeaſe, the patient is directed to obſerve no particular regimen, but may go about his affairs as uſual. This method of cure, as is allowed may be preſcribed to very good purpoſe, in this ſtubborn diſeaſe; but it is not thought ſo effectual as ſalivation, without which, Turner is of opinion, that exoſtoſes and carious tophi cannot be cured.

The third method of curing the french pox, is by mercurial frictions, which Deſault gives as follows: when the patient has a pox of a long continuance, and the venereal poiſon is diſperſed all over the body, he ſhould be prepared by bathing and drinking whey. But in a recent pox the bath is not neceſſary. After this, inſtead of raiſing a ſalivation, he brings on a flux of the belly, by means of clyſters of a decoction of ſenna and the pulp of caſſia, before the frictions are adminiſtered. When he finds that the looſeneſs does not anſwer the number of frictions, nor the quantity of mercury made uſe of, he purges the patient with powder of jalap, and procures copious ſtools. While the looſeneſs is going on, the friction does the office of a purge; and in proportion as they are repeated, the flux of the belly revives; and when it ſlackens or ſtops, he has recourſe to the clyſters and purges of jalap. He purſues this method till the ſymptoms ceaſe, and till he is perſuaded, by the abundance of the evacuations, the venereal poiſon is entirely drained off. By this means he carries off the pox and gonorrhœa at once. Dr. Douglas not only approved, but uſed this method with ſucceſs. The frictions are to be made with mercurial ointment, and one third of quickſilver, from two or three drams to an ounce or an ounce and a half, every night or every other night.

The fourth and laſt method of curing this diſtemper, is with ſtrong decoctions of guaiacum. This we have the firſt account of, from Sir Ulric Hutten, who purſued it himſelf. A pound of guaiacum is to be boiled in a gallon of ſpring-water, to one half, and the ſcum reſerved to anoint the ſores; and a ſecond decoction is to be uſed for common drink. Boerhaave, who recommends this method, ſuppoſes that a ſalivation will be ineffectual, if every drop of fat in the blood is not melted down into water, and carried off; and the patient reduced to a death-like paleneſs. He likewiſe ſuppoſes, that guaiacum performs its taſk by reſolving all the unctuous particles, whether incorporated in the maſs of blood, or accumulated in their proper repoſitories; and by emaciating the habit ſo exquiſitely, as not to leave one drop of oil therein. He directs the patient to keep in a room of ſuch a warmth, as that its mere heat will incline him to ſweat: he adviſes alſo, through the whole courſe of the cure, to abſtain from every thing that has the leaſt oilineſs in its nature, eating nothing but ſea-biſcuits and raiſins, and drinking only a weaker decoction of guaiacum. He muſt alſo drink eight ounces every day of the ſtrong decoction, the more the better, till ſome days his habit is bloated with it, as if he had the dropſy. After this let the patient every morning drink faſting as much of the decoction as his ſtomach will hold, and place himſelf in an erect poſture in a ſweating-box; or if he lies a-bed, let a ſtove be put under it. In either place he muſt receive on his naked body the ſteam of kindled ſpirits of wine, and there let him ſweat as long and as plentiful as his ſtrength will allow. After he has ſuffered this heat for half an hour, let the flame be extinguiſhed and the patient ſweat in his bed, about half an hour longer. After which let him take eight or ten ounces of veal-broth boiled in a ſmall quantity of rice, but void of fat. His body muſt now be carefully wiped with warm dry flannel, after which let him riſe and drink of his decoction, as formerly throughout the day. This muſt be done morning and evening in every article, for fourteen days ſucceſſively; after this, in the morning fourteen days more.

PRACTICE, in arithmetic, or rules of practice, are certain compendious ways of working the rule of proportion, or golden-rule. See RULE of THREE.

Caſe I. When a queſtion in the rule of three being duly ſtated, and the extremes are ſimple numbers of one name; whether the middle term be ſimple or mixt; if the extreme, which by the general rule is the diviſor, be 1, and the middle term, an aliquot part, of ſome ſuperior ſpecies; then divide the other extreme by the denominator of that aliquot part, the quote is the anſwer in that ſuperior ſpecies; and if there is any remainder, it muſt be reduced, and its value found.

Example 1. What is the price of 67 yards of cloth at 5s. per yard? The ſtate of the proportion is, as 1 yd. : 5 s. : : 67; and becauſe the diviſor is 1 yd. and the middle term 5 s. which is a fourth part of one pound. Therefore divide 67 yds. by 4, the quote is 16 l. and 3 remains, which reduced to ſhillings, and divided by 4, quotes 15 s.

The reaſon of this practice is obvious; for if 1 yd. coſt ¼ of 1 l. 67 yds. muſt coſt 67 ¼th parts, or, which is the ſame thing, the fourth part of 67 l.

Example 2. The value of 54 ſtone weight, at 10 s. (= ½ of 1 l.) per ſtone, is 27 l. equal ½ of 54.

Caſe II. If the price of an unit is an even number of ſhillings, multiply the other extreme (of the ſame name with the unit) by the half of that number; double the firſt figure of the product for ſhillings, and the remaining figures to the left, are pounds in the anſwer.

Example 1. What is the value of 324 yds. at 6 s. per yard?

Multiplying 324 by 3 (the ½ of 6) the product is 972, which according to the rule, is 97 l. 4 s. which is the anſwer. And it is very eaſy to ſet down the ſhillings and pounds ſeparately, without writing firſt down the total product, and then ſeparating them.

The reaſon of this practice is, that if we multiply the whole even number of ſhillings, the product is the anſwer in ſhillings; which divided by 20, reduces it to pounds, the remainder being ſhillings: but if we multiply only the half of theſe ſhillings, the product is only the half of the value in ſhillings. Now ſuppoſe we multiply this product by 2, to give the whole number of ſhillings, and divide this laſt product by 20, to reduce them to pounds; then, becauſe 20 is two times 10, it is plain that the product made by the half of the given price, being firſt multiplied by 2, and this product divided by 20 (or, which is the ſame thing, firſt by 2, and the quote by 10) the laſt quote will be the ſame as if that firſt product were only divided by 10; becauſe to multiply by 2, and then divide the product by 2, brings back the ſame number that was multiplied: wherefore it is plain, that if the firſt product is divided by 10, the quote is the anſwer in pounds and tenth parts; and, becauſe the diviſor is 10, therefore the integral quote, or pounds, are expreſſed by the dividend, excluding the firſt figure on the right hand; and becauſe that figure is the number of tenth parts, therefore the double of it is the number of twentieth parts, that is, of ſhillings, and thus every part of the rule is clear.

Obſerve; if the price of one unit conſiſts of pounds and ſhillings, whoſe half reduced to ſhillings is a number by which we can eaſily multiply, ſo as to bring out the product in one line at the firſt ſtep, as we may if that half doth not exceed 29, then we alſo uſe the above method.

Example. What is the price of 467 yds. at 1 l. 14 s. per yard? Here 1 l. 14 s. is 34 s. whoſe half is 17, by which multiplying 467, according to the rule, the anſwer is 793 l. 18 s.

Caſe III. If the middle term is not an aliquot part of ſome ſuperior integer, (the diviſor being always 1) yet it may be equal to the ſum of ſeveral aliquot parts; and then if you divide by the denominators of each of theſe ſeparately, and add all the quotes, the ſame is the anſwer required.

Example. If 1 yd. coſt 15 s. what coſt 49 yards? Anſwer 36 l. 15 s. found thus; 15 s. is 10 s. and 5 s. viz. the ½ and ¼ of 1 l. ſo I take the ½ of 49 l. which is 24 l. 10 s. and ¼, which is 12 l. 5 s. whoſe ſum is 36 l. 15 s.

The reaſon of this is plain, but it is to be obſerved, that in moſt caſes where the middle term is not an aliquot part, the common rule by reduction is eaſier.

Caſe IV. If the middle term is ſo mixed as to have in it any number of the higheſt ſpecies, firſt multiply the number, and then the other parts by ſome of the former caſes, if poſſible, and if this cannot be done, or not without much working; then the common method of reduction is to be taken.

Example 1. If 1 yd. coſt 4 l. 6 s. 8 d. what coſt 734 yards? Anſwer 3180 l. 13 s. 4 d. for 4 l. multiplied by 734, produces 2936 l. and for 6 s. 8 d. which is the ⅓ of 1 l. you muſt take the ⅓ of 734, which is 244 l. 13 s. 4 d. and the ſum of both is 3180 l. 13 s. 4 d.

Example 2. Suppoſe the price of 1 yd. 3 l. 7 s. 9 d. then no method by aliquot parts is ſo eaſy as the common method by reduction.

Caſe V. If the extreme which is the multiplier is an aliquot part, or the ſum of certain aliquot parts, of the unit which

which is divisor, then take by division such part or parts of the middle term, (whether this be a simple, or mixed number,) and if the multiplier has also some number of the same species with the unit, you must work for that number separately by some of the former cases, or the common rule; then add all the parts, which is the answer.

Example 1. If 1 pound weight cost 32 l. what cost 4 ounces? Answer 8 l. *viz.* $\frac{1}{4}$ of 32 l. because 4 ounces are $\frac{1}{4}$ of 1 lb.

Example 2. If 1 l. buy 3 hund. weight 1 qr. 7 lb. how much will 28 l. 5 s. 6 d. buy? Answer 93 ct. 2 qrs, 18 lb. $\frac{4}{10}$ oz. which is found thus; first for the 28 l. multiply 3 ct. by it, which gives 84 ct; then for 1 qr. take $\frac{1}{4}$ of 28, is 7 ct. and for 7 lb. take $\frac{1}{16}$ of 28, is 1 ct. 3 qrs. or, which is the same thing, take $\frac{1}{4}$ of 7 ct. because 7 lb. is $\frac{1}{4}$ of 1 qr. so the total for 28 l. is 92 ct. 3 qrs. for 5 s. which is $\frac{1}{4}$ of 1 l. take $\frac{1}{4}$ of 3 ct. 1 qr. 7 lb. it is 3 qr. 8 lb. 12 oz. and for 6 d. which is $\frac{1}{10}$ of 5 s. take $\frac{1}{10}$ of 3 qr. 8 lb. 12 oz. it is 9 lb. $\frac{4}{10}$ oz. so the total for 5 s. 6 d. is 3 qr. 18 lb. $\frac{4}{10}$ oz. and to this adding 92 ct. 3 qr. the sum is 93 ct. 2 qr. 18 lb. $\frac{4}{10}$ oz.

The work.	ct.	qr.	lb.
	3	1	7
	28		
	84		
	7		
	1	03	
Sum	92	03	

	ct.	qr.	lb.	oz.
4	3	1	7	00
10		3	8	12
			9	04 $\frac{4}{10}$
		3	18	00 $\frac{4}{10}$
	92	3	00	00
	93	2	18	00 $\frac{4}{10}$

Note. If the multiplier and the middle term are both of the same kind of things, then we may consider either as the multiplier, as shall be most convenient for the operation.

Example. If 1 l. gain 4 s. 6 d. how much is thereby gained upon 34 l. 10 s? Answer 7 l. 15 s. 3 d.

Which is found two ways, *viz.* First multiply 4 s. 6 d. by 34 l. 10 s. thus; 4 s. by 34, makes 6 l. 16 s. and 6 d. by 34, makes 17 s. then 4 s. 6 d. by 10 d. or $\frac{1}{2}$, makes 2 s. 3 d. and the total is 7 l. 10 s. 3 d. Or secondly multiply 34 l. 10 s. by 4 s. 6 d. thus; 4 s. 6 d. is 2 s. and 2 s. 6 d. therefore 34 l. 10 s. multiplied by 2 s. or $\frac{1}{10}$, the product is 3 l. 9 s. then by 2 s. 6 d. or $\frac{1}{8}$, it is 4 l. 6 s. 3 d. and the total is, as before, 7 l. 15 s. 3 d. Thus,

l.	s.	d.	The product of
	4	6	
6	16		4 s. by 34
	17		6 d. by 34
	2	3	4 s. 6 d. by $\frac{1}{2}$
7	15	3	

l.	s.	d.	The product of 34 l. 10 s.
34	10		
3	9		by 2 s. or $\frac{1}{10}$
4	6	3	by 2 s. 6 d. or $\frac{1}{8}$
7	15	3	

These are the chief and fundamental practices by aliquot parts, which who ever understands, will easily find many particular abridgments depending upon the same principles.

PRÆ, a latin preposition, literally signifying *before*, and used in many words in our language, to denote the relation of priority; though they are often written with a common *e* instead of the *æ*; as præcession or precession, prædecessor or predecessor, *&c.* See the articles Precession, Predecessor, *&c.*

PRAGMATIC sanction, in the civil law, is defined by Hottoman to be a rescript, or answer of the sovereign, delivered by advice of his council, to some college, order, or body of people, upon consulting him on some case of their community. The like answer given to any particular person, is called simply rescript. The term pragmatic sanction, is chiefly applied to a settlement of Charles VI. emperor of Germany, who, in the year 1722, having no sons, settled his hereditary dominions on his eldest daughter, the archdutchess Maria Theresa, which was confirmed by the diet of the empire, and guaranteed by Great Britain, France, the States-General, and most of the powers in Europe.

PRAGMATICAL, a term used sometimes in the same sense as practical, mechanical or problematical.

PRAGUE, the capital of Bohemia, situated on the river Mulda, in east long. 14° 20′ north lat. 50°. This is a strong fine city, and, next to London, Paris, and Constantinople, the largest in Europe.

PRAMNION, in natural history, the name of a semi pellucid gem, so distinct from all others, as to make a peculiar genus of fossils.

This is a very singular stone, and of a very

very great concealed beauty: our lapidaries, when they meet with it, call it by the name of the black agate. It is of an extremely cloſe, compact, and firm texture, of a ſmooth and equal ſurface, and in ſhape very irregular; being ſometimes round, ſometimes oblong, and often flat; in ſize it ſeldom exceeds two inches. It appears, on a common inſpection, to be of a fine, deep black: but held up againſt the ſun, or the light of a candle, it is an elegant red, clouded by a quantity of ſubtile black earth. We have it from the Eaſt-Indies.

PRASIUM, in botany, a genus of the didynamia gymnioſpermia claſs of plants, the corolla whereof conſiſts of a ſingle ringent petal; the upper lip is erect, roundiſh, abſolutely emarginated, and concave; the under one is broader, reflex, and divided into three ſegments: the fruit conſiſts of four roundiſh, unilocular berries, in the bottom of the cup: the ſeeds are roundiſh and ſolitary.

PRASIUS, PRASITES, in natural hiſtory, the name of a gem much approaching to the nature of the emerald, but wanting its hardneſs, and being of a coarſer green, with an admixture of yellow. It is, even in its moſt perfect ſtate, much leſs beautiful than moſt of the other gems, and is found of various ſizes, but ſeldom ſmaller than a pea or larger than a nutmeg. It is alſo of various figures, but is never columnar; it is frequently of an orbicular form, flatted on one ſide and convex on the other, and often oblong or oval, but more uſually it is of an irregular ſhape, made up of a number of flat faces. Its colour is a deep green, uſually with a bluiſh caſt, and always with a greater or leſs admixture of yellow.

PRATIQUE, or PRATTIC, in commerce, a negotiation, or communication, of commerce, which a merchant-veſſel obtains in the port it arrives in, and the countries it diſcovers: hence to obtain a pratique, is to obtain a liberty to frequent a port, to go aſhore, to buy and ſell, *&c.*

Pratique is particularly uſed for a licence to traffic, granted to the maſter of a ſhip in the ports of Italy upon a bill of health; that is, a certificate that the place whence he came is not annoyed with any infectious diſeaſe.

PRATOLINO, a city of Tuſcany, eight miles north of Florence, where the great duke has a palace and gardens, with ſome of the fineſt water-works in Italy.

PRAYER, in theology, a petition put up to God, either for the obtaining ſome future favour, or the returning of thanks for a paſt one.

With regard to prayer, Jeſus Chriſt forbids his diſciples to lengthen them by vain and impertinent repetitions. The Jews, antiently, when they went to pray, covered their head and face with a veil, as a mark of humility and confuſion, when they appeared before the divine preſence; the poſtures they uſed were either ſtanding, according to the example of holy men recorded in Scripture, or bowing, kneeling, or proſtrating. They always turned their faces towards the temple, if they dwelt at Jeruſalem; and towards Judea, if they lived elſewhere. The duty of prayer is ſtrongly enforced in the koran. The Turks are directed to pray five times every day. They kneel at prayers, laying their back parts on their heels. The old Lacedemonians had a peculiar form of prayer: for they never uſed, either in their public or private devotions, to make any other requeſt than, that the gods would grant whatever was honourable and good for them: there were ſeveral ceremonies attending the manner of their ſupplicating the gods, and the poſtures they uſed were different; but the moſt common was kneeling.

Divines diſtinguiſh three kinds of prayer, vocal, which is cloathed in words and ſounds, to be uttered by the mouth; mental, which is only formed or conceived in the mind, and not delivered in words; and ejaculatory, which is a ſhort ſudden flight, without ſtudy, order, or method. Among us prayer is moſt frequently conſidered under the diviſions of preconceived and extemporary: under the firſt come all ſet forms, whether public or private, by which the mind is directed in the order, manner, expreſſion, *&c.* of its petitions; the ſecond is that where the mind is left to itſelf, and its own conduct, both as to matter, manner, words, *&c.* The Romaniſts prefer prayers to ſaints, the virgin, the angel Gabriel, *&c.* See the article SAINT, AVE-MARIA, *&c.*

PREACHING, in theology, the promulgation of the word of God in public; or the making a ſermon, or public oration on ſome paſſage in the ſacred Scriptures, in order to inform the judgment and mend the lives of the hearers.

PREADAMITE, a denomination given to the inhabitants of the earth who, according to fome people, lived before Adam.

Iſaac de Pereyra, in 1655, publiſhed a book, in which he attempted to prove that the Jews alone were deſcended from Adam; and that the Gentiles, whom he called Preadamites, lived long before Adam: this book was anſwered by Demarets, profeſſor of theology at Groningen.

PREAMBLE, in law, the beginning of an act of parliament, *&c.* which ferves to open the intent of the act, and the miſchiefs intended to be remedied by it.

PREBEND, the maintenance a prebendary receives out of the eſtate of a cathedral or collegiate church. Prebends are diſtinguiſhed into fimple and dignitary; a fimple prebend has no more than the revenue for its fupport: but a prebend with dignity, has always a juriſdiction annexed to it.

Theological or *divinity* PREBEND, in France, is a prebend appropriated to a doctor of divinity in each cathedral and collegiate church, for preaching on Sundays, and making a public lecture thrice a week.

Preceptorial PREBEND, is a prebend whoſe revenues are deſtined for the fupport of a preceptor or maſter, who is obliged to inſtruct the youth of the place gratis.

PREBENDARY, an eccleſiaſtic who enjoys a prebend.

The difference between a prebendary and a canon is, that the former receives his prebend, in conſideration of his officiating in the church; but the latter merely by his being received into the cathedral or college.

Golden PREBENDARY *of Hereford,* called alſo *prebendarius epiſcopus,* is one of the twenty-eight minor prebendaries, who has, *ex officio,* the firſt canon's place that falls. He was antiently confeſſor of the biſhop and cathedral, and had the offerings at the altar; on which account he was called the golden prebendary.

PRECE PARTIUM, in law, the continuance of a fuit by conſent of both parties.

PRECEDENCE, or PRECEDENCY, a place of honour to which a perſon is entitled: this is either of courteſy or of right. The former is that which is due to age, eſtate, *&c.* which is regulated by cuſtom and civility: the latter is fettled by authority, and when broken in upon gives an action at law.

The point of precedency is thus fettled by the heralds: after the king, the princes of the blood, as fons, grandfons, brothers, and nephews of the king; then the archbiſhop of Canterbury, the lord chancellor, or lord keeper of the great ſeal, the archbiſhop of York, the lord high treaſurer, the lord preſident of the privy council, the lord privy ſeal; next dukes, marquiſes, dukes eldeſt fons, earls, marquiſes eldeſt fons, dukes younger fons, viſcounts, earls eldeſt fons, marquiſes younger fons, biſhops, barons, ſpeaker of the houſe of commons, viſcounts eldeſt fons, earls younger fons, barons eldeſt fons, knights of the garter commoners, privy counſellors commoners, the chancellor of the exchequer, chief juſtice of the king's bench, maſter of the rolls, chief juſtice of the common pleas, chief baron of the exchequer, juſtices and barons of the ſaid courts, viſcounts younger fons, barons younger fons, baronets, knights of the bath, field and flag officers, knights bachelors, maſters in chancery, doctors graduate, ſerjeants at law, eſquires, gentlemen, citizens, yeomen, burgeſſes.

The great officers of the court take place above all others of the fame order of nobility; *viz.* the maſter of the horſe, lord great chamberlain of England, lord marſhal of England, lord ſteward of the houſehold, and lord chamberlain of his majeſty's houſehold: ſo the ſecretaries of ſtate, if peers, take place of all of that degree, except the great officers aforeſaid. Dukes, marquiſes, earls, *&c.* not having any of the ſaid offices, nor deſcended of the blood royal, take place according to the ſeniority of their creation. The ladies take place according to the quality of their huſbands.

PRECEDENT, in law, a caſe which has been determined, and which ferves as a rule for all of the fame nature: thus the precedents of a court have the force of laws, and no court will reverſe a judgment contrary to many precedents.

Precedent alſo frequently denotes an original authentic inſtrument or writing, which ferves as a form to draw others by.

PRECENTOR, a dignitary in cathedrals, popularly called the chantor, or maſter of the choir.

PRECEPT, in law, a command in writing ſent by a chief juſtice, juſtice of the peace, *&c.* for bringing a perſon, record, or other matter, before him.

Precept is alſo uſed for the command or incitement by which one man ſtirs up another

another to commit felony, theft, *&c.*

PRECESSION, *præcessio*, in astronomy, a term applied to a slow motion of the equinoctial points towards the west; that is, in the language of astronomers, *in antecedentia*, or contrary to the order of the signs. See the article SIGN.

This motion of the equinoctial points is occasioned by the poles of the world revolving round those of the ecliptic: in order to illustrate which, let D C H (plate CCVIII. fig. 2.) be a part of the earth's orbit, C its center, E C the axis of the ecliptic, E its pole, C P the axis of the earth, P its pole; through the points E and P draw the great circle EPA, meeting the ecliptic A L in A; the arch P A is equal to the inclination of the axis of the earth to the plane of the ecliptic, *viz.* the angle P C H, which is found by observation to be about 66° 30′, and therefore its complemental arch E P, or angle P C E = 23° 30′.

Through the pole P, from the point E, describe a lesser circle P F G, which will be parallel to the ecliptic; then, if the axis of the earth be directed at any particular time to P, it is found by observations of many years, that it will not be constantly directed to the point P, but in seventy-two years time be directed to some other point Q, so that the arch P Q = 1 degree; and therefore, in the space of 360 × 72 = 25920 years, the point P, or pole of the world, will describe the circle P F G, about the pole of the ecliptic E, which revolution is called *annus magnus*, the great year; after which, the stars being re-instated in their proper places, the antients imagined there would be a total renovation of all things.

The cause of this conical motion of the earth's axis was unknown to all the astronomers before Sir Isaac Newton's time, none of them being able to guess from whence it could proceed; but this sublime geometer soon investigated its cause, and demonstrated that it results from the laws of motion and gravity, that is, from the spheroidical figure of the earth; for if the earth was a perfect sphere, its axis would always continue parallel to itself, and consequently have no such motion. Hence the reason of the precession of the equinoctial points may be easily conceived; for the circle E P A, passing through both the pole of the ecliptic and equator, will be the solstitial colure, and A the solstitial point, when the axis of the earth points to P; but after seventy-two years, when it points to Q, then the great circle E Q B will be the solsticial colure, and B the solstice. And because the equinoctial points are always ninety degrees distant from the solstices, they must consequently move in the same time, through the same arch, and the same way, *viz.* westward, or in antecedentia.

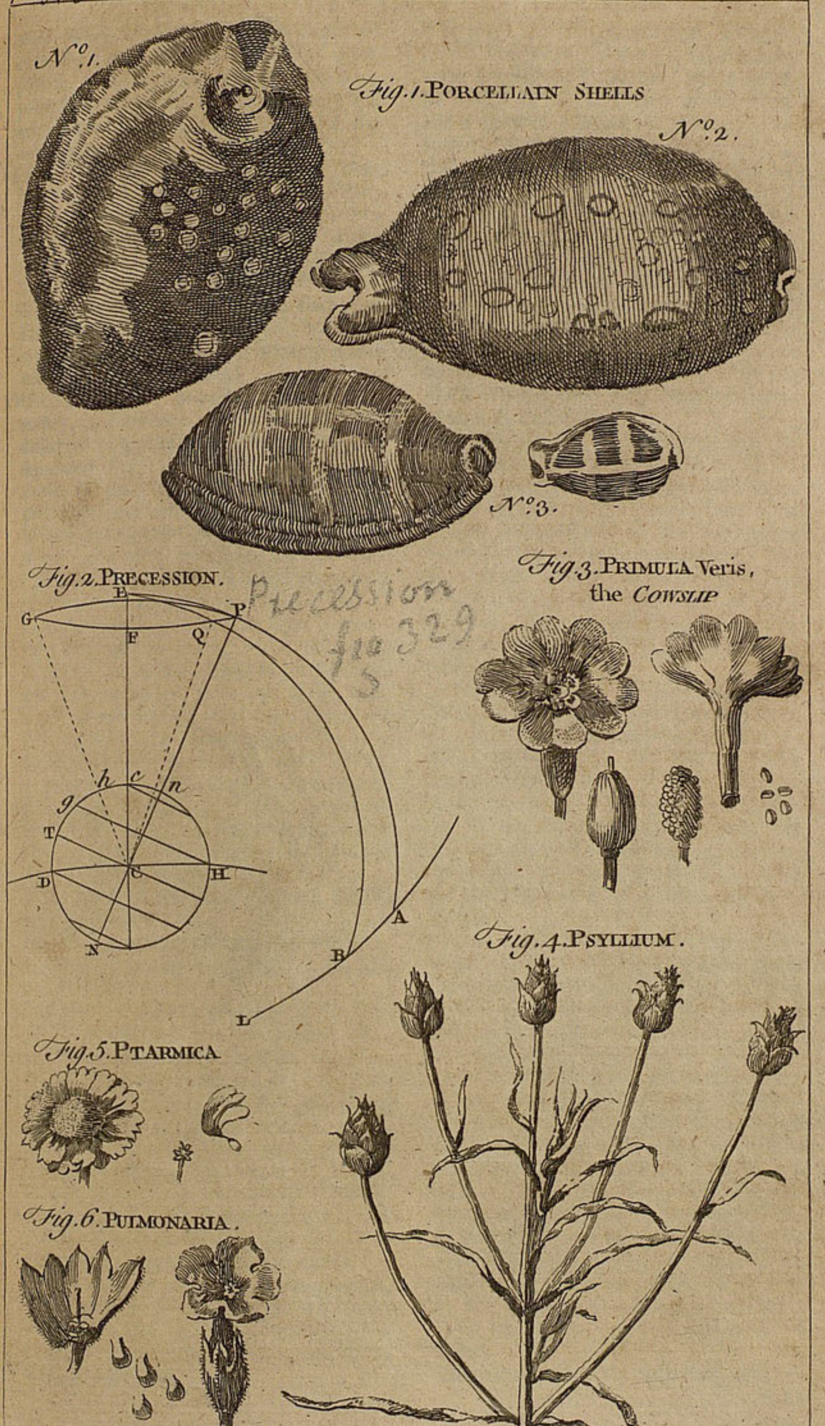
This retrograde motion, by carrying the equinoctial points to meet the sun in his apparent annual motion, makes him arrive at them sooner every year than he would do if those points continued immoveable: and this arch of regression being 50″ a year, or one degree in seventy-two years, makes the equinoxes happen 20′ in time sooner each year than they would otherwise do. And though this change be not sensible in a few years, yet these points are found to have a very different situation from what they had two thousand years ago.

By reason of this precession of the equinoctial points, the fixed stars seem to move towards the east, and thereby to have their longitude, which is always reckoned upon the ecliptic, from the vernal equinoctial point, encreased: and hence the constellations seem to have deserted the places allotted them by the antient astronomers; for instance, the beginning of the sign aries, which in Hipparchus's time, was near the vernal equinoctial point, and gave name to that point of the ecliptic, is now removed near a whole sign, or thirty degrees, eastward; so that aries is now where taurus used to be, taurus where gemini used to be, *&c.* and thus all the constellations of the zodiac have changed their antient places; but to avoid confusion, astronomers have thought fit to let the several portions of the ecliptic, where these constellations were at first observed to be, retain their old names; so that the vernal equinoctial point is still reckoned the first degree of aries. However these portions of the ecliptic, where the constellations were at first, are called *anastra*, to distinguish them from the places where they now are, which are termed *stellata*. See the article CONSTELLATION.

PRECIOUS STONES, or GEMS, in natural history. See the article GEM.

PRECIPE, or PRAECIPE QUOD REDDAT, in law, a writ that extends as well to writs of right as to other writs of entry and possession.

It is sometimes called a writ of right close,



T. Jefferys sculp.

close, when issued out of the court of chancery close; sometimes a writ of right patent, when it issues out of chancery, patent, or open, to any lords court for any of his tenants deforced, against his deforcer.

PRECIPITANT *præcipitans*, in chemistry, is applied to any liquor, which, when poured on a solution, separates what is dissolved, and makes it precipitate, or fall to the bottom of the vessel.

The term precipitant is also used, in medicine, to denote any remedy that moderates the heat of the blood, by separating, as is supposed, any heterogeneous matter contained therein.

PRECIPITATE, *præcipitatus*, in chemistry, a substance which having been dissolved in a proper menstruum, is again separated from its solvent, and thrown down to the bottom of the vessel, by pouring some other liquor upon it.

White precipitate of mercury is made thus: take of sal armoniac and of corrosive sublimate, each an equal quantity; dissolve them together in common water, and filtrate the solution through paper: then add oil of tartar per deliquium, enough to cause the matter to precipitate: pour off the water, and add more fresh water several times; and when the powder has been thus perfectly freed from its acrimony, let it be dried for use; which is principally in unguents for cutaneous foulnesses, a dram of it to an ounce of pomatum, being the usual proportion; for if used internally, it not only purges and sometimes vomits, but is very apt to bring on a salivation. See the article SALIVATION.

For the other preparations of mercury, improperly called precipitates, see the article MERCURY.

PRECIPITATION, *precipitatio*, a process in chemistry, which is a kind of separation, whereby the particles of a body dissolved and suspended in any menstruous liquor, are detached therefrom, and fall down to the bottom of the vessel. These particles sometimes precipitate of their own accord, but oftener by the assistance of some other liquor added to the menstruum. So that precipitation is the reseparating solid bodies from any fluid menstruum, wherein they are dissolved, by the addition of a third body, which, counteracting the power of the menstruum, causes that which was dissolved to regain its solid form, and subside in the state of a powder.

The great law of precipitation, according to Dr. Shaw, is this; whenever one body has dissolved another, and a third be added to the solution; which third has a greater relation to either of the former, than they have to each other; then the union of the two first will be dissolved, and the third uniting itself either with the first or second, leaves the other at liberty to fall to the bottom, or rise to the top, according to its specific gravity: thus if camphor be dissolved in spirit of wine, and water be added to the solution, it is thereby made to float upon the surface; because there is a greater appetite of union between water and the spirit of wine, than there is between camphor and that spirit.

As precipitation is apparently opposite to solution, its application must be necessarily founded on the same principles. The manner of its performance is a simple commixture of the precipitant with the solution to be precipitated; only with this caution in respect to bodies which produce much ebullition on their mixture, that the precipitant should be added gradually, lest they overflow the vessel.

After the precipitated sediment is perfectly formed, it must be recovered from the fluid by a proper method of exsiccation; to which, in the case of saline bodies, edulcoration is likewise previously necessary. This is best performed by filtring off the fluid and laying out the wet powder, when of a consistence, in drops or pieces, as was before directed in the preparation of powders by levigation.

To account for the process of precipitation. A fluid menstruum may be made to sustain a body specifically heavier than itself, either by making the resistance arising from the cohesion of the parts of the fluid equal to the excess of specific gravity of those bodies above that of the menstruum; or by the heavy bodies being joined to some lighter one; so that the two together only make one whole equal in weight to the fluid. In the first case, we know the resistance is still proportional to the surface of the corpuscles; so that the surface being diminished, the resistance is weakened: the proportion therefore of the tenacity of the menstruum to the gravity of the corpuscles being thus destroyed, a precipitation must ensue.

Boerhaave makes the following observations

tions on the different manner in which precipitation is performed by several different agents. 1. By water poured on oils dissolved in alcohol, where the liquor turns milky. 2. By water poured to solid resins dissolved in alcohol, where also the liquor turns milky. 3. By water in the distillation of oily spirits, if any water run after the spirit is drawn off. 4. By acids on acids; thus silver and mercury are precipitated out of spirit of nitre, in which they have been dissolved by adding spirit of salt. 5. By metals with metals, and other bodies. Thus, for example, dilute an ounce of silver dissolved in spirit of nitre, with twelve times the quantity of rain-water; put polished plates of copper into this liquor, and the silver will be precipitated, and the copper dissolved: then put this solution of copper into another glass, and add to it polished plates of iron; the copper will be precipitated and case over the iron; finally, the copper falls to the bottom, and the iron dissolves. Pour this solution of iron into a fresh glass, and drop upon it oil of tartar per deliquium; the dissolved iron immediately falls to the bottom, and the alkali unites with the acid, and regenerates true nitre, after so many changes. Thus does this salt travel from one body to another almost unaltered, though it is more attracted by one than another, till at length it rests in that which in this respect is the strongest, and is from thence expelled, when oil of vitriol is poured upon the nitre thus regenerated. On these two principles precipitation depends, and is the true and often abstruse cause of numberless wonderful operations, both in art and nature. Take a grain of white or red precipitate, rub it upon a polished and heated copper-plate, and wherever the matter has passed, the copper will immediately look like silver; for the copper attracts the acid of the nitre from the calx of the mercury, and thus presently makes an amalgam upon the surface of the copper, and then acquires a silver colour. 6. Alkalies often precipitate things dissolved by acids. This happens frequently, but not always, nor in perfection: alkali precipitates copper dissolved by an acid, but the copper is afterwards dissolved by a salt made of the two. 7. Acids generally precipitate things dissolved by alkalies; but in this case also there are some processes which shew us exceptions. 8. Sharp salts, without being changed, and lying perfectly concealed, have strange and unexpected effects by means of precipitation. If an ounce of luna cornea, which is perfectly scentless, insipid, and unactive, and affords no sign of acrimony in the fire, be ground, and united in a strong heat in a glass retort with half an ounce of inodorous and perfectly insipid regulus of antimony, there instantly arises an extremely strong poison, or an exceedingly corrosive butter of antimony, the exhalation of which proves mortal. We see in this one instance how dangerous the art of mixing is, and with what care we ought to go about the compounding of bodies.

PRECIPUT, or PRÆCIPUATE, in the french jurisprudence, denotes the right of primogeniture among coparceners, whereby the eldest has always the principal fief, or manor.

PRECISION, *præcisio*, among logicians, the same with abstraction. See the article ABSTRACTION.

PRECONISATION, in the consistory of Rome, a declaration made by the cardinal-patron, or protector, of a person nominated by some prince to a prelature, by virtue of letters-patent, whereof he is the bearer; with which the pope complying, gives his collation. See the article COLLATION.

PRECONTRACT, in law, properly signifies a contract made before another, but is chiefly applied to marriage-contracts. See CONTRACT and MARRIAGE.

PRECOP, an old decayed city of european Turky, situated at the entrance of the Isthmus which unites Little Tartary to the peninsula of Crim Tartary: east longitude 37° 40′, north latitude 46° 40′.

PRECORDIA, *præcordia*, in anatomy, a general name for the parts situated about the heart, in the fore-part of the thorax as the diaphragm, pericardium, and even the heart itself, with the spleen, lungs, &c. See HEART, DIAPHRAGM, &c.

PRECURSOR, *præcursor*, in theology, denotes a fore-runner, or person who goes before any one to notify his coming. The term precursor, however, is peculiarly applied to St. John the Baptist, who is styled the precursor of Jesus Christ.

PREDECESSOR, properly signifies a person who has preceded or gone before another in the same office or employment;

ment; in which sense, it is distinguished from anceftor. See ANCESTORS.

PREDESTINATION, in general, signifies a decree of God, whereby, from all eternity, he ordained such a concatenation of causes as must produce every event by a kind of fatal necessity, and maugre all opposition. See the articles FATE, NECESSITY, &c.

In this sense, the Turks are great predestinarians; and on this account are much more daring in battle, and willingly encounter greater dangers than they would otherwise do. See MAHOMETANS.

Predestination, among christians, is used in a more limited sense, for a judgment or decree of God, whereby he has resolved, from all eternity, to save a certain number of persons, from thence called elect; so that the rest of mankind being left in a state of impenitence, are said to be reprobated. See REPROBATION.

Nothing has occasioned more disputes than this thorny subject of predestination; the lutherans speak of it with horror, whilst the calvinists contend for it with great zeal; the molinists and jesuits preach it down as a most dangerous doctrine, whilst the jansenists assert it as an article of faith; the arminians, remonstrants, and pelagians, are all avowed enemies to predestination. See LUTHERANS, CALVINISTS, JESUITS, &c.

PREDETERMINATION, in philosophy, that concurrence of God, which determines men in all their actions, both good and evil; and this concurrence, or influence, is called physical predetermination, or premotion: for divines maintain, that God has no share in the sins of mankind, inasmuch as he only affords his concurrence to the physical part of their actions, not to the moral part.

But whether even such a physical concurrence be necessary, is strongly controverted. The scotists urge, that all natural causes are, of their own natures, determined to certain actions; whence it should seem needless to call in any farther assistance: for the nature of fire, for instance, being to warm things properly applied to it; when any thing is so applied, what occasion for any foreign influence to cause the fire extert its heat upon it? Again, this predetermination seems still less requisite to produce human actions; since the soul must be at least allowed the common privilege of a second cause, and to produce its own actions as well as other strictly natural agents. See the articles WILL and CAUSE.

The thomists, on the other hand, strongly assert physical predetermination, arguing from the subordination of second causes to the first: for, say they, where there are several subordinate causes, the lower do not act unless moved thereto by the first. Another argument they draw from the dominion of God; for according to them, the essence of all dominion consists in directing and applying things subject thereto, to its own operations; if the dominion be moral, morally; and if it be also physical, physically.

PREDIAL TITHES, are those that are paid of things arising and growing from the ground only; as corn, hay, fruit, &c. See the article TITHES.

PREDICABLE, among logicians, denotes a general quality which may be predicated, or asserted of several things: thus animal is predicable of mankind, beasts, birds, fishes, &c.

Predicables are only general or abstract ideas, for a farther account of which, see the articles ABSTRACT, IDEA, and GENERAL TERMS.

The schoolmen reduce predicables to five classes, *viz.* genus, species, proprium, difference, and accidens. See the articles GENUS, SPECIES, &c.

PREDICAMENT, among logicians, the same with category. See CATEGORY.

PREDICATE, *prædicatum*, in logic, that part of a proposition which affirms or denies something of the subject: thus, in these propositions, *snow is white, ink is not white*, whiteness is the predicate which is affirmed of snow, and denied of ink. See the article PROPOSITION.

It is a celebrated law in predicates, that nothing is esteemed to be absolutely affirmed of another, unless it be affirmed in such a manner, as wants nothing either in the subject, predicate, or copula to make it true.

This also is a noted property of a predicate, that it contains in some measure its own subject; thus metal contains gold, silver, copper, &c. of which it is predicated.

Every predicate is indeed an attribute; but every attribute is not a predicate; thus soul, learning, are attributed to man, but not predicated of him.

PREDICATING, in logic, the act of affirming or denying something of a thing, as a man is not an angel; body is a substance, &c.

Things predicated of others are reducible,

ble, 1. To genera, as animal, of a man, *&c.* 2. Forms, as whitenefs, of fnow, *&c.* And, 3. Equals, of things of equal extent, as fpecies, difference, property, *&c.*

The fchoolmen diftinguifh feveral ways of predicating, as, 1. In quod tantum, which is to predicate effentially, both as to the thing and manner, as *honour is a virtue.* 2. In quale tantum, which is to predicate accidentally, both as to the thing and manner, as *John is a fcholar.* And, 3. In quale quid, or in quale poft quid, which is to predicate both effentially and accidentally, as *man is rational.*

PREDICTION, *prædictio,* the foretelling of what is to come, either by divine revelation, art, or conjecture.

PREDOMINANT, *prædominans,* that which prevails, or has fome fuperiority, over another thing.

PRE-EMPTION, *præemptio,* a privilege antiently allowed the king's pourveyor, to have the firft buying of corn, *&c.* for the king's houfhold, but taken away by ftat. 19 Car. II.

PREENING, in natural hiftory, the action of birds dreffing their feathers, to enable them to glide the more readily through the air, *&c.*

For this purpofe they have two peculiar glands on their rump, which fecrete an unctuous matter into a bag that is perforated, out of which the bird occafionally draws it with its bill.

PRE-EXISTENCE, *præ-exiftentia,* the ftate of a thing actually in being before another.

PREFACE, *præfatio,* fomething introductory to a book, to inform the reader of the defign, method, *&c.* obferved therein; and generally whatever is neceffary to facilitate the underftanding of a book.

Prefacing is a peculiar fpecies of writing, being neither argumentation, difcourfe, narration, nor apology.

PREFECT, *præfectus,* in antient Rome, one of the chief magiftrates who governed in the abfence of the kings, confuls, and emperors.

This power was greateft under the emperors. His chief care was the government of the city, taking cognizance of all crimes committed therein, and within a hundred miles. He judged capitally and finally, and even prefided in the fenate. He had the fuperintendance of the provifions, building, and navigation.

The prefect of modern Rome differs little from the antient præfectus, his authority only extending to forty miles round the city.

PREFECT *of the prætorium, præfectus prætorii,* the leader of the pretorian bands deftined for the emperor's guards, confifting, according to Dion, of 10,000 men. This officer, according to Suetonius, was inftituted by Auguftus, and ufually taken from among the knights.

By the favour of the emperors his power grew very confiderable; to reduce which, Conftantine divided the prefecture of the prætorium into four prefectures, and each of thefe again he fubdivided into civil and military departments, though the name was only referved to him who was invefted with the civil authority, and that of comes belli given him who commanded the cohorts.

PREFIX, or AFFIX, in grammar, a particle added at the beginning of a word, either to diverfify its form, or to alter its fignification.

PREGNANCY, *graviditas,* the ftate of a woman who has conceived, or is with child. See the articles GENERATION, CONCEPTION, FOETUS, *&c.*

The ftopping of the menftrual difcharge, is the firft fign of pregnancy; then a fwelling of the belly, in a globofe, not irregular, protuberant figure; and about the twentieth week of pregnancy, the motion of the fœtus: and, indeed, this motion is the only certain fymptom, by which a living fœtus can be diftinguifhed from a mole. See the article MOLE.

The feveral diforders incident to pregnant women, as hæmorrhages, flatulencies, hæmorrhoids, *&c.* are treated of under their refpective articles HÆMORRHAGE, FLATULENCY, *&c.*

But more efpecially the article ABORTION ought to be confulted, where the means of preventing this dangerous, and but too often fatal accident, are particularly confidered.

And as to the methods of delivery, and the treatment both of the mother and child during the time of lying-in, *&c.* they may be found under the articles DELIVERY, INFANT, LOCHIA, LYING-IN WOMEN, *&c.*

Negative PREGNANT, in law. See the article NEGATIVE.

PREJUDICE, *præjudicium,* does not mean a judgment merely as prior to another in refpect of time, but as being paffed before the things were duly confidered and fully underftood. Hence prejudice is

is sometimes called anticipation, and a preconceived opinion; and makes one of the many causes of error. See ERROR.

PRELATE, an ecclesiastic raised to some eminent and superior dignity in the church; as bishops, archbishops, patriarchs, &c. See BISHOP, &c.

PRELIMINARY, in general, denotes something to be examined and determined, before an affair can be treated of to the purpose.

The preliminaries of peace consist chiefly in settling the powers of embassadors, and certain points in dispute, which must be determined previous to the treaty itself. See the articles EMBASSADOR, TREATY, &c.

PRELUDE, *præludium*, in music, is usually a flourish or irregular air, which a musician plays off-hand, to try if his instrument be in tune, and so lead him into the piece to be played. Very often the whole band in the orchestra run a few divisions, to give the tune.

PREMISES, or PREMISSES, *præmissæ*, in logic, an appellation given to the two first propositions of a syllogism, as going before, or preceding the conclusion. See the article SYLLOGISM.

Premises are the foundation or principles of our reasoning; which being either self-evident or demonstrative propositions, the truth of the conclusion is equally evident.

PREMISES, in law, properly signifies the land, &c. mentioned in the beginning of a deed. See the article DEED.

PREMISLAW, a city of Poland, in the province of Red Russia, situated 110 miles south-east of Cracow: east long. 22°, north lat. 49°.

PREMIUM, or PRÆMIUM, properly signifies a reward or recompence; but it is chiefly used in a mercantile sense for the sum of money given to an insurer whether of ships, houses, lives, &c. See the article INSURANCE.

The term premium is also applied to what is given for a thing above par, or prime cost: thus if lottery-tickets sell for 20 s. more than prime cost, or the price at which the government issued them, this 20 s. is called a premium. Some also use premium in a synonymous sense with bounty. See BOUNTY.

A lender of money accepting a voluntary premium from the borrower on payment of principal and interest, shall not be within the statutes against usury. See the article USURY.

PREMONSTRATENSES, in church-history, a religious order, instituted by St. Norbert, about the year 1119.

PREMOTION, *præmotio*, the same with predetermination. See the article PREDETERMINATION.

PREMUNIENTES, in law, writs dispatched to the bishops, to call them to parliament; warning them to bring with them the deans and archdeacons, one proctor for each chapter, and two for the clergy of each diocese. See the article CONVOCATION.

PREMUNIRE, or PRÆMUNIRE, in law, is taken two ways; either for a writ, or for the offence for which it is granted.

Formerly the church of Rome carried its pretended right of supremacy to such a height, that several statutes were made to check and restrain the growing power of the pope; but more especially stat. 16 Rich. II. c. 5. commonly known by the name of the statute of premunire, which ordains the punishment of offenders on this statute to be this: that they should be out of the king's protection, attached by their bodies, *i. e.* imprisoned at the king's pleasure, and lose their lands, goods, and chattels.

Premunire is now chiefly used for the above punishment, which is incurred not only by those who assert the pope's supremacy; but also by those who refuse to take the oath of allegiance, or of the king's supremacy, &c.

It is said no person, who has incurred a premunire, can bring any action; and a writ of premunire lies as well for a party grieved, as for the king; but the laws making offences a premunire are so very severe, that they are seldom put in execution.

PRENANTHES, in botany, a genus of the syngenesia-polygamia æqualis class of plants, the compound flower of which is not imbricated, but consists of five equal hermaphrodite flowers, which are monopetalous, ligulated, quadridentated, and placed in a single circle: the seeds are single, or one after each flower, cordated, and contained in the cup.

PRENDER, in law, signifies the power or right a person has to take a thing, before it is offered.

And prender de baron, literally signifies to take a husband; but in law it is used as an exception, to disable the widow from pursuing an appeal of murder, against one who had killed her former husband.

PRENOMEN, *prænomen*, among the antient Romans, a name prefixed to their family-name, anſwering to our chriſtian name: ſuch are Caius, Lucius, Marcus.

PRENOTION, *prænotio*, a piece of knowledge, naturally preceding ſome other; as the knowledge of the antecedent; which muſt precede that of the conſequent.

PREPARING MEDICINES, *præparantia medicamenta*, ſuch as prepare the morbid humours, and diſpoſe them to ſeparate from the healthy, and paſs off by evacuation.

Some have alſo given the appellation of preparing veſſels, *vaſa præparantia*, to the ſpermatic veſſels. See the articles GENERATION and SPERMATIC.

PREPARATION, *præparatio*, in mathematics, ſomething preparatory to the demonſtration of a propoſition. Thus if a propoſition in geometry is to be demonſtrated, the preparation conſiſts in drawing certain lines; and if a propoſition in arithmetic, in ſome computation to be previouſly made to come at the demonſtration.

PREPARATION, in pharmacy. &c. the manner of preparing and managing any medicine, in order to fit it to ſerve the purpoſes for which it is intended.

The operations which go by this name are various, as decoction, infuſion, calcination, ſublimation, &c. See the article DECOCTION, &c.

PREPARATION, in anatomy, the art of preſerving the parts of animals for anatomical uſes; which is done either by drying them thoroughly, or putting them in a proper liquor.

In drying parts which are thick, when the weather is warm, care muſt be taken to prevent putrefaction, fly-blows, inſects, &c. This is eaſily done by the uſe of a ſolution of corroſive ſublimate in ſpirit of wine, in the proportion of two drachms of ſublimate to a pound of ſpirit: the part ſhould be moiſtened with this liquor as it dries; and by this method the body of a child may be kept ſafe even in ſummer. Dried preparations are apt to crack and moulder away in keeping; to prevent this their ſurface ſhould be covered with a thick varniſh, repeated as often as occaſion requires.

Though ſeveral parts prepared dry are uſeful, yet others muſt be ſo managed as to be always flexible, and nearer a natural ſtate; which may be done in a well rectified colourleſs ſpirit of wine, to which is added a ſmall quantity of the ſpirit of vitriol or nitre. When theſe are properly mixed, they neither change their colour nor the conſiſtence of the parts, except where there are ſerous or mucous liquors contained in them. The brain, even of a young child, in this mixture grows ſo firm as to admit of gentle handling, as do alſo the vitreous and chryſtaline humours of the eye. The liquor of the ſebaceous glands and the ſemen, are coagulated by this ſpirituous mixture; and it heightens the red colour of the injection of the blood-veſſels, ſo that after the part has been in it a little time, ſeveral veſſels appear which were before inviſible. If you will compare theſe effects with what Ruyſch has ſaid of his balſam, you will find the liquor above-mentioned to come very near to it. The proportion of the two ſpirits muſt be changed according to the part prepared: for the brain and humours of the eye, you muſt put two drachms of ſpirit of nitre to one pound of ſpirit of wine. In preſerving other parts which are harder, thirty or forty drops of the acid will be ſufficient; a larger quantity will make bones flexible, and even diſſolve them. The part thus preſerved ſhould be always kept covered with the liquor, therefore great care ſhould be taken to ſtop the mouth of the glaſs with a waxed cork and a bladder tied over it, to prevent the evaporation of the ſpirit.

Some prefer malt-ſpirit to ſpirit of wine, becauſe this laſt is apt to change into a brown colour; whereas the malt-ſpirit never loſes its limpid appearance.

PREPENSED, *præpenſus*, in law, denotes fore-thought: thus when a man is ſlain upon a ſudden quarrel, if there was malice prepenſed formerly between them, it makes it murder.

PREPOSITION, *præpoſitio*, in grammar, one of the parts of ſpeech, being an indeclinable particle which yet ſerves to govern the nouns that follow it; ſuch as *per*, *pro*, *propter*; and through, for, with, &c.

F. Buffier allows it to be only a modificative of a part of ſpeech, ſerving to circumſtantiate a noun.

PREPOSITUS *villæ*, ſometimes denotes the chief officer of the king in a town, manor, or village. In antient records, he

he was no more than the lord's bailiff; he is alfo, in later writers, the conftable or petty conftable.

PREPUCE, *præputium*, in anatomy, the forefkin; being a prolongation of the cutis of the penis, covering the glans. See the article PENIS.

PREROGATIVE, *prærogativa*, a pre-eminence which one perfon has over another.

PREROGATIVE *of the king*, *prærogativa regis*, that power which the king hath, not only over other perfons, but over the ordinary courfe of the common law, in right of his crown.

Such as, that he may pardon a perfon condemned to die, that the king's perfon is fubject to no man's fuit, his poffeffions cannot he taken from him by any violence, his goods are fubject to no tribute, nor deftrainable, &c.

PREROGATIVE-COURT, a court belonging to the archbifhop of Canterbury, wherein wills are proved and adminiftrations granted that belong to the archbifhop by his prerogative; that is, where the party, at his death, had five pounds, or upwards, out of the diocefe where he died, and within the archbifhop's province. See WILL, PROBATE, &c.

All citations and decrees run in the archbifhop's name.

This court is kept in the common-hall in Doctors-commons, in the afternoon, next day after the Arches. The judge is attended by the regifter, who fets down the acts of the court, keeps records, original wills, &c. It is called the prerogative-office, now kept in Deans-court, London.

The archbifhop of York hath alfo the like court, called his exchequer.

PRESA, in the italian mufic, a character or mark fhewing when and where a performer in a concert is to begin to fing or play: but in particular, in fugues or canons, it is thus marked ∺ over the note at which the fecond part, which is to follow or imitate the firft, muft begin. If the mark be repeated a fecond time, it is to fhew the place where the third part muft begin, to imitate the fecond; and fo on through all the parts.

PRESAGE, *præfagium*, in antiquity, denotes an augury, or fign of fome future event; which was chiefly taken from the flight of birds, the entrails of victims, &c. See AUGURY and ARUSPICES.

Among phyficians, the term prefage is fometimes ufed for prognoftic fign. See the article PROGNOSTIC.

PRESBURG, the capital of Hungary, a large city, on the north fide of the Danube, fifty miles eaft of Vienna: eaft long. 17° 30′, north lat. 48° 20′.

PRESBYS, in ornithology, a name by which fome have called the regulus criftatus, or golden crowned wren.

PRESBYTA, πρεσβύτης, in optics, a perfon whofe eyes being flat, can fee diftant objects diftinctly, but thofe near confufedly; which defect of fight got this appellation, becaufe old people are naturally fubject to it.

Spectacles, or convex glaffes, are the only remedy for this defect; for if thefe are well fitted to the degree of flatnefs of the eyes, they caufe the rays of light to converge in fuch a manner from near objects, as to make them fall exactly on the retina, and thereby produce diftinct vifion. See the article VISION.

PRESBYTER, in the primitive chriftian church, an elder, one of the fecond order of ecclefiaftics; the other two being bifhops and deacons. See the articles BISHOP and DEACON.

Prefbyter, or elder, is a word borrowed from the greek tranflation of the old teftament, where it commonly fignifies ruler or governor; it being a note of office and dignity, not of age, and in this fenfe bifhops are fometimes called prefbyters in the new teftament. The prefbyters might baptize, preach, confecrate and adminifter the eucharift in the bifhop's abfence, in his prefence, if he authorized and deputed them; and the bifhops did fcarce any thing in the government of the church without their advice, confent and amicable concurrence.

The grand difpute between the followers of the geneva and roman difcipline is about the famenefs and difference of prefbyters and bifhops at the time of the apoftles.

PRESBYTERIANS, a fect of proteftants, fo called from their maintaining that the government of the church appointed in the new teftament was by prefbyteries; that is, by minifters and ruling elders, affociated for its government and difcipline.

The prefbyterians affirm, that there is no order in the church as eftablifhed by Chrift and his apoftles, fuperior to that of prefbyters; that all minifters being ambaffadors of Chrift, are equal by their com-

commiſſion; and that elder or preſbyter, and biſhop are the ſame in name and office: for which they alledge, *Acts* xx. 28, *&c.*

The only difference between them and the church of England, relates to diſcipline and church-government. Their higheſt aſſembly is a ſynod, which may be provincial, national, or œcumenical; and they allow of appeals from inferior to ſuperior aſſemblies; according to *Acts* xv. 2, 6, 22, 23. The next aſſembly is compoſed of a number of miniſters and elders, aſſociated for governing the churches within certain bounds. This authority they found upon *Acts* xi. 30. *Acts* xv. 4, 6, *&c.* The loweſt of their aſſemblies or preſbyteries, conſiſts of the miniſter and elders of a congregation who have power to cite before them any member, and to admoniſh, inſtruct, rebuke and ſuſpend him from the euchariſt. They have alſo a deacon, whoſe office is to take care of the poor.

The ordination of their miniſters is by prayer, faſting, and impoſition of the hands of the preſbytery. This is now the diſcipline of the church of Scotland.

PRESCIENCE, in theology, fore-knowledge, or the knowledge which God has of events before they come to paſs.

PRESCRIPTION, in law, is a right or title acquired by uſe and time, introduced for aſſuring the property of effects, in favour of perſons who have for a certain time had them in their poſſeſſion. Preſcription has been called, a penalty impoſed by the laws upon negligence; but the law of preſcription does not puniſh the indolence of proprietors, but only interprets their ſilence for their conſent; preſuming that a man who neglects to aſſert his right for a ſeries of years, gives it up. In the common law, preſcription is uſually underſtood of a poſſeſſion from time immemorial, or beyond the memory of man: but in the civil law, and even in our common law, there are preſcriptions of a much ſhorter date. See the article POSSESSION.

The things a perſon may make title to by preſcription are, a fair, market, toll, way, water, rent, common, park, warren, franchiſe, court-leet, waifs, eſtrays, *&c.* There is likewiſe a preſcription againſt actions and ſtatutes: thus by the 31 Eliz. c. 1. it is ordained that all actions, *&c.* that are brought upon ſtatutes, the penalty whereof belongs to the king, ſhall be brought within two years after the offence is committed, or ſhall be void. By our ſtatutes alſo, a judge or clerk convicted of falſe entering of pleas, *&c.* may be ſued within two years; but the crime of maintenance or embracery, whereby perjury is committed by a jury, muſt be proſecuted within ſix days, or otherwiſe the parties preſcribe. See the articles LIMITATION and ACTION.

PRESCRIPTION, in medicine, is the aſſigning a proper and adequate remedy to a diſeaſe, from an examination of its ſymptoms, and an acquaintance with the virtues and effects of the materia medica.

Quincy gives the following directions in relation to preſcriptions. In all chronic caſes, medicines are to be contrived as near to a diet, as poſſible, and therefore the common drinks and foods are to be medicated as far as they will admit, and the caſe requires. But in acute caſes, which are generally dangerous, all aſſiſtance muſt be called in that can be had, according to the exigency of the caſe; and as medicines of efficacy are here made uſe of, they are moſt ſafely diſtributed into boles or draughts, in order that the doſe may be aſcertained to the greateſt exactneſs, eſpecially where opiates are uſed: care is here to be taken to ſet all the helps to co-operate together, ſo that they may not interfere with each other: thus a bole or a powder may be given every three, four, or ſix hours, with a draught, julep, or any other liquid form after it; and herein may be dropt ſpirits, tinctures, *&c.* of the like intention, and alſo into their common drink: and the night-doſes, or others, if neceſſary, may be joined with an opiate: externals, if neceſſary, may alſo be ordered at the ſame time; and if bliſters are applied, as they frequently occaſion ſtranguries and heat of urine, emulſions may come in for common drink. Known medicines ſhould be diſguiſed as much as poſſible, and all extemporaneous medicines be contrived, not only with all the elegance and pleaſantneſs poſſible, but alſo into the ſmalleſt doſes they are capable of: thus draughts to grown perſons ought never to exceed four ounces, and to be ſeldom above three, and boles ought ſeldom to weigh above two drams. But the moſt general and neceſſary rule in all caſes is, to anſwer the end by as few medicines as poſſible, and never to make a cure worſe than the diſeaſe.

PRESENCE, *præſentia*, a term of relation

tion used in opposition to absence, and signifying the existence of a person in a certain place, or the state of a person considered as co-existing with another. In this sense, an obligation is said to be passed in presence of a notary and witnesses. At the breaking open the seal of a minor or absent person, the presence of a substitute is necessary: where a superior magistrate is present, it sometimes takes away the power of an inferior. It has been held, that the presence of one feoffee may serve for all the rest.

PRESENSANO, a town of Italy, twenty-eight miles north of Naples.

PRESENT, *præsens*, in grammar, the first tense of a verb, expressing the present time, or that something is now performing; as *scribo*, I write, or am writing. See the article TENSE.

PRESENTATION, in law, the act of a patron offering his clerk to be instituted in a benefice of his gift, the same being void.

All persons that have ability to make a purchase or grant, may also present to vacant benefices in their gift; though where a clergyman is patron of a church, he cannot present himself; but may pray to be admitted by the bishop, and the admission shall be effectual. An infant of any age may also present in his own name; but a presentation by a feme covert, must be in the name of both husband and wife. As coparceners make but one patron, they are either to present jointly, or the eldest may present first, and the rest in their turn. Joint-tenants must also join in a presentation; and when a corporation presents, it must be under their common seal. Aliens born and papists cannot present to benefices, which are presented to by the universities; but a popish recusant may grant his patronage to another, who may present where there is no fraud.

A patron may revoke his presentation before institution, but not afterwards: and a right of presenting to the next avoidance of a church, whether granted by will or deed, will pass; but a presentation whilst the church is full, is judged void.

PRESENTE'E, the clerk presented to a benefice by the patron. See the article PRESENTATION.

PRESENTMENT, in law, a denunciation of jurors, or a justice of the peace, or other officers, without any information of an offence inquirable by the court, to which it is presented; or it may be said to be an information made by the jury in a court before a judge, who has authority to punish any offence committed contrary to law; and it is what the grand jury finds and presents to the court, without any bill of indictment delivered: yet it is afterwards reduced into the form of an indictment. A presentment is drawn up in a short note by the jurors, as an instruction to draw the indictment by it; and presentments are made by justices of the peace, in their sessions of offences against statutes, in order to their punishment in the superior courts; and also in courts-leet and courts-baron, before the stewards thereof; as likewise by constables, church-wardens, surveyors of highways, *&c.* of matters belonging to their respective offices.

Assize of darrein PRESENTMENT. See the article QUARE.

PRESENTS, in law, the same with benevolences, or free gifts; especially those given by the clergy, or the states of the realm, to the king.

PRESEPE, or PRÆSEPE, in astronomy, the name given to three nebulous stars in the breast of cancer. See CANCER.

PRESERVATION, in general, denotes the art of preserving things in a state of perfection; or, at least, from being so far corrupted and spoiled, as to be no longer useful.

Animal substances are preserved by curing, pickling, drying, or chemical preparation. See the articles CURING, PICKLE, PREPARATION, *&c.*

For the method of preserving corn in granaries, see CORN and GRANARY.

Fruits may be long preserved in spirit of wine, first well saturated with the skins and tinging parts of those fruits; and many may be tolerably preserved in perfectly fermented liquors, which generate no more air. The more solid vegetable substances may be preserved by gently drying in the sun, shade, or other slack heat. Thus peas or beans may be dried young in a slack oven in their proper season, and may afterwards be boiled in the winter, and will eat young and tender, as if just gathered. The ways of preserving fruits, both dry and moist, with sugar, are now universally known; and there are in the several ways many secrets in the hands of particular artists, which it would be well to have generally known. See the article FRUIT.

As for the methods of curing and pre-

ferving vegetable juices and liquors by decoction, infpiffation, fermentation, clarification, matching, *&c.* See DECOCTION, INSPISSATING, *&c.*

PRESERVATIVE, among phyficians, denotes a medicine taken by way of precaution; or, to fecure a man from a difeafe that threatens him.

The principal prefervatives, according to Boerhaave, are abftinence, quiet, drinking warm water; and, after this, a gentle and continued motion till the firft appearance of fweat; then a profound fleep, the body being well covered.

In the time of a plague, prefervatives are very neceffary againft the contagion of the air.

Generous wines, cardiacs, and fudorifics, are alfo powerful prefervatives.

PRESIDENT, *præfes,* an officer created or elected to prefide over a company, in contradiftinction to the other members, who are called refidents.

The lord prefident of the council is the fourth great officer of the crown, as antient as king John, when he was ftiled conciliarius capitalis. His office is to attend on the king, propofe bufinefs at the council table, and report the tranfactions there to the king. See COUNCIL.

The lord prefident of the court of feffion, in Scotland, is the firft of the fifteen lords, who prefides in that auguft affembly, which is the fupreme court of juftice in that kingdom. See SESSION.

PRESIDIAL, a bench of judges eftablifhed in the feveral cities of France, to judge ultimately of all the caufes brought before them by way of appeal from the fubaltern judges.

The edict of 1551 eftablifhes prefidials thus: 1. That they may judge definitively to the fum of two hundred and fifty livres, or ten livres per annum. 2. To the fum of one thoufand five hundred livres by provifion.

PRESIDII, a fmall territory in Italy, on the coaft of Tufcany, called *State del prefidii,* or the garrifons; confifting of feveral towns garrifoned by the king of Spain, of which the chief are Orbitello, Porto Hercole, and Telamon.

PRESS, *prelum,* in the mechanic arts, a machine of wood, or iron, ferving to fqueeze any body very clofe. Thus, let A B plate CCX. fig. 2. be a cheefe-prefs; where C E, F G, are levers moveable about the points, D, E, F, G, by applying the hand at C; S, the ftone, or weight; and H, the cheefe to be preffed. Now if $CD = 5$, $DE = 2$, $FG = 6$, $GH = 2$, $FR = 1$, $FH = 4$; then in the lever C E, D is the fulcrum. Call the power at C 1; then the force at E or F is $\frac{5}{2}$. And in the lever F G, whofe fulcrum is G, if the power at F be 1, the force at R is $\frac{6}{5}$; and therefore the power at C is to the weight S, as 1 to $\frac{5}{2} \times \frac{6}{5}$, or 3. Alfo the weight of the ftone at R is to the preffure at H, as 2 to 5, or 1 to $\frac{5}{2}$; and the power at C is to the preffure at H, as 1 to $3 \times \frac{5}{2}$, or $7\frac{1}{2}$.

Preffes ufually confift of fix pieces; two flat fmooth planks, between which the things to be preffed are laid; two fcrews or worms faftened to the lower plank, and paffing thro' two holes in the upper; and two nuts in form of an S, that ferve to drive the upper plank, which is moveable, againft the lower which is fixed.

Preffes ufed for expreffing liquors are in moft refpects the fame with the common preffes, only the under plank is perforated with a great number of holes for the juice to run through. Others have only one fcrew or arbor, paffing through the middle of the moveable plank, which defcends into a kind of fquare box, full of holes, through which the juices flow, as the arbor is turned.

But that the reader may be enabled to form a more diftinct idea of thefe preffes, we fhall give a draught of the common and great wine prefs ufed for fqueezing the juice out of grapes.

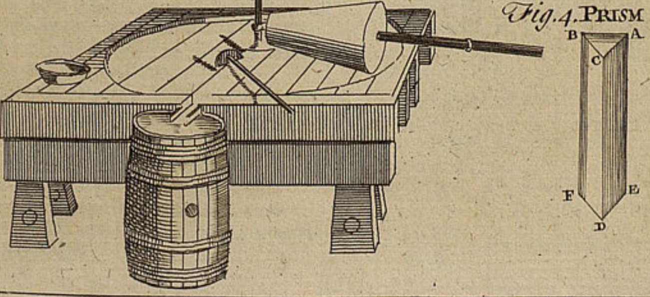
A B (plate CCIX. fig. 1.) is the bafe or pedeftal and other fupporters of the common wine-prefs. C, C, the cheeks, which are upright beams, the lower extremities of which are funk in the earth, where they are ftrongly fixed by crofsbars and mafonry: they are traverfed at top by two beams, the lowermoft of which is the nut, or receptacle of the fcrew. D is the fcrew with its wheel. E the bearer, or large piece of timber on which the wheels reft, in order to fink the beams croffing the planks that cover the grapes, F. G, G, the maye, or planks on which the grapes are difpofed, in order to be fqueezed: thefe planks are cut in notches, to receive the liquor and convey it to a veffel appropriated to receive it. The maye is fupported on a maffive work of mafonry. H is the wheel that ferves to force down the fcrew and bearer upon the grapes, which are laid upon the maye in a fquare heap: this it does by winding off the cord from the

Fig. 1. The common *WINE-PRESS.*

Fig. 2. The great *WINE-PRESS.*

Fig. 3. A *PRESS* to make Verjuice, or to Squeeze Apples

Fig. 4. PRISM



T. Jefferys sculp.

the wheel of the ſcrew D, by which means the ſcrew and the bearer E, are preſſed down upon the grapes, which are uſually covered with croſs-beams reared above each other. I is a leather-pipe, terminating in two wooden tubes, for conveying the wine from one piece to another. K is a large bellows to agitate the wine when it has ſettled into an even ſurface in both veſſels. L the ſame bellows in profile. M is a large fountain, which affords a quick flow. And N is a ſtopple to cloſe the veſſel newly filled, and prevent the wine from running over, upon withdrawing the wooden tube.

A B (*ibid.* fig. 2.) repreſents the baſe and other ſupports of the great wine-preſs; C, C, *&c.* the cheeks, or ſide-beams; D, D, great beams, two in number at leaſt, and frequently four, or even ſix; E, the ſcrew; F, the nut of the preſs; G, the wheel, which, by the help of five or ſix men, turns the ſcrew; and H, the cage, which is an aſſemblage of ſeveral ſtrong pieces of timber formed into a ſquare, and lined with maſonry within. This cage is ten feet long, and four and an half broad on each ſide, and may be either raiſed out of, or ſunk into the pit of maſon-work I; from whence it is exhibited as aſcending in the figure referred. It uſually weighs three thouſand pounds; and being ſuſpended in the manner repreſented, forms, in conjunction with the ſcrew, a lever of an immenſe force for ſqueezing down a bearer upon grapes placed upon the maye K, as in the former figure. See the article WINE.

As to cyder-preſſes, the beſt and leaſt chargeable, is that called the box-preſs (*ibid.* fig. 3.) with which you may ſqueeze apples, pears, grapes, or any other fruit, to make wine, cyder, perry, or verjuice: for as one end of the box terminates in a moveable beam, which is worked by a wheel and a ſcrew in the uſual manner; ſo there are holes in the ſide of the box, through which the juice flows by a ſpout into the veſſel deſigned to receive it. See the article CYDER.

The olive-preſs has been already deſcribed under the article OLIVE.

The preſs uſed by joiners to keep cloſe the pannels, *&c.* of wainſcot, conſiſts of two ſcrews, and two pieces of wood four or five inches ſquare, and two or three feet long, whereof the holes at the two ends ſerve for nuts to the ſcrews.

The preſs uſed by inlayers, reſembles the joiners-preſs, only the pieces of wood are thicker, and only one of them moveable; the other, which is in form of a treſſel, being ſuſtained by two legs joined into it at each end.

This ſerves for ſawing and cleaving of wood required in marquetry. See the article MARQUETRY.

The founders-preſs is a ſtrong ſquare frame, conſiſting of four pieces of wood firmly joined together with tenons, *&c.* It is of various ſizes: two of them are required to each mould, at the two extremes whereof they are placed; ſo as that, by driving wooden wedges between the mould and ſides of the preſs, the two parts of the mould for the metal may be preſſed cloſe together. See FOUNDERY.

The book-binders-preſs conſiſts of two large wooden cheeks joined by two ſtrong wooden ſcrews; which, being turned by an iron-bar, draw together or ſet aſunder the cheeks at pleaſure. See BOOK-BINDING.

The cheeks are placed flat on a wooden ſtand, in form of a cheſt, into which the cuttings fall. A-ſide of the cheeks are two pieces of wood of the ſame length with the ſcrews, ſerving to direct the cheeks. Upon the cheeks is the ſhaft or fuſt, to which the cutting knife is faſtened by a ſcrew which has its key to diſmount it on occaſion.

The ſhaft conſiſts of ſeveral parts; a wooden ſcrew, which, catching within the nut of the two feet that ſuſtain it, brings the knife to the paper, which is faſtened in the preſs. This ſcrew, which is pretty long, has two directories, which reſemble thoſe of the ſcrew of the cheeks. To make the ſhaft ſlide ſquare, that foot of the ſhaft where the knife is not fixed, has a kind of groove directed by a thread faſtened along one of the cheeks. Laſtly, the knife is a piece of ſteel ſix or ſeven inches long, pointed a-top, and ſquare all the reſt.

The preſs uſed in the woollen manufactory is a large wooden machine, ſerving to preſs cloaths, ſerges, *&c.* to render them ſmooth, and give them a gloſs. See plate CCX. fig. 4. where N D is a preſs with an iron-ſcrew, and K E a preſs with a wooden ſcrew.

The principal parts of this machine are the cheeks of the preſs, marked A, A, *&c.* the nut, in which the box is fixed, marked B, B; the windlas, C; an iron-ſcrew, D; a wooden-ſcrew, E; a female-ſcrew, or box, to receive the male one, F; the bed to lay the fold-

ed ſtuff on, K; an iron-lantern, L; and a wooden one, M; and N, the ſtuff in the preſs.

The preſs for linnens, ſilks, *&c.* is called a calender. See CALENDER.

For the rolling and printing-preſs, ſee the article PRINTING.

PRESSING, in the manufactures, is the violently ſqueezing a cloth, ſtuff, *&c.* to render it ſmooth and gloſſy.

There are two methods of preſſing, *viz.* cold or hot.

As to the former, or cold preſſing, after the ſtuff has been ſcoured, fulled, and ſhorn, it is folded ſquare in equal plaits, and a ſkin of vellum, or paſteboard, put between each plait. Over the whole is laid a ſquare wooden plank, and ſo put into the preſs; which is ſcrewed down tight by means of a lever. After it has lain a ſufficient time in the preſs, they take it out, removing the paſteboards, and lay it up to keep.

Some only lay the ſtuff on a firm table, after plaiting and paſteboarding, cover the whole with a wooden plank, and load it with a proper weight.

The method of preſſing hot is this: When the ſtuff has received the above preparations, it is ſprinkled a little with water, ſometimes gum water, then plaited equally, and between each two plaits are put leaves of paſteboard; and between every ſixth or ſeventh plait, as well as over the whole, an iron or braſs-plate well heated in a kind of furnace. This done, it is laid upon the preſs, and forcibly ſcrewed down.

Under this preſs are laid five, ſix, *&c.* pieces at the ſame time, all furniſhed with their paſteboards and iron plates. When the plates are well cold, the ſtuffs are taken out and ſtitched a little together to keep them in the plaits.

This manner of preſſing was only invented to cover the defects of the ſtuffs; and, accordingly, it has been frequently prohibited.

PRESSOVIA, a town of Little Poland, ſituated on the Viſtula, twenty miles eaſt of Cracow.

PRESSURE, or PRESSION, in general, denotes the ſqueezing a thing cloſe together. The preſſure of fluids has been already explained under the articles FLUID, AIR, *&c.*

The Carteſians ſuppoſe the action of air to conſiſt in a ſort of preſſure. But Sir Iſaac Newton has taught us better: for if light conſiſted only in a preſſion, without actual motion, it could not warm ſuch bodies as reflect and refract it; and if it conſiſted in an inſtantaneous motion, as ſuch preſſion ſuppoſes, there would be required an infinite force to produce that motion every moment in every lucid particle: hence it muſt follow, that light would inflect itſelf ad umbram; for preſſion, in a fluid medium, cannot be propagated in right lines beyond any obſtacle which ſhall hinder any part of the motion; but will inflect and diffuſe itſelf every way into thoſe parts of the quieſcent medium, which lie beyond the ſaid obſtacle. See Newton's *Optics.*

PREST, a duty in money paid by the ſheriff upon his account in the exchequer, for money remaining in his hands.

PREST-MONEY, the money given to new liſted ſoldiers, ſo called becauſe it binds thoſe who receive it, to be ready at all times.

PRESTATION, ſignifies the payment of a certain ſum by arch-deacons, and other clergymen, annually to their biſhop.

PRESTER, in phyſiology, a meteor conſiſting of an exhalation, thrown from the clouds downwards with ſuch violence, as by the colliſion it is ſet on fire. It differs from the thunder-bolt in the manner of its inflammation, and its burning and breaking every thing it touches with greater vehemence.

PRESTER-JOHN, or JEAN, an appellation given to the king of Abyſſinia, or Ethiopia. See the article ETHIOPIA. This name is altogether unknown in Ethiopia, where he is called the grand Negus.

PRESTIMONY, in the cannon-law, denotes a fund or revenue, appropriated by the founder for the maintenance of a prieſt; without being erected into any title of benefice, chapel, priory, *&c.* and which is not ſubject either to the pope, or to the ordinary; but whereof the patron, and thoſe who have a right from him, are the collators, and nominate and confer, pleno jure. Though others explain it ſomewhat differently.

PRESTO, in the italian muſic, intimates to perform very quick, as *preſtiſſimo* does extremely ſo.

PRESTON, a borough-town, twenty miles ſouth of Lancaſter, which ſends two members to parliament.

PRESUMPTION, in law, ſignifies an opinion or belief of a thing.

There are three kinds of it. 1. Violent preſumption, which is frequently taken as

as a full proof; as if a person is found killed in a house, and at the same time a man is seen to come out with a bloody sword or knife, and no other person was then in the house; this is a violent presumption, and amounts to a proof that the said man was the murderer. 2. Probable presumption may be of some though but small weight. 3. Light presumption which signifies nothing at all.

Where all the witnesses to a feoffment, or other deed, are dead, continual and quiet possession is a violent presumption: also if a landlord give a receipt for the last year's rent due of a long term, it is presumed in law that all the rest are likewise paid, though the tenant should not be able to produce receipts.

PRESUMPTIVE HEIR, the same with heir at law. See the article HEIR.

PRETENCE, or *escutcheon of* PRETENCE, in heraldry, See ESCUTCHEON.

PRETENDER; by statute 1 George I. c. 1. the lord treasurer, *&c.* is impowered to give 100000 pounds as a reward to any one that shall seize and secure his person, whenever he shall land, or attempt it in England, *&c.*

PRETENSED RIGHT, in law, is where a person is in possession of lands, and another that is not in possession claims and sues for them; in which case, the pretended right is said to be in him who claims and sues for the same.

PRETERIT, *præteritum*, in grammar, a tense which expresses the time past, or an action completely finished; as *scripsi*, I have wrote.

But besides the præterit perfect, as it is called, already explained, there are other two taken notice of by grammarians, *viz.* the imperfect and plusquamperfect. See the article IMPERFECT.

The plusquamperfect, *præteritum plusquam perfectum*, is a tense which respects a past time, and expresses that the action was then completely finished; as *scripseram*, I had written.

The several circumstances of the past time are distinguished in latin, greek, *&c.* by particular terminations of the verb. But the modern languages, particularly the english, *&c.* instead of different terminations, have usually recourse to those of their auxiliaries and participles.

PRETERITION, in rhetoric, a figure whereby, in pretending to pass over a thing untouched, we take a summary view of it.

PRETEXT, a colour or motive, whether real or feigned, for doing something.

PRETEXTA, or TOGA PRÆTEXTA, among the antient Romans, a long white gown, with a border of purple round the edges, and worn by children of quality till the age of puberty, *viz.* by the boys till seventeen, when they changed it for the toga virilis; and by the girls, till marriage.

PRETIOUS, or PRECIOUS. See the article PRECIOUS.

PRETOR, or PRÆTOR, a magistrate among the antient Romans, not unlike our lord chief justices, or lord chancellor, or both in one; as being vested with the power of distributing justice among the citizens. At first there was only one pretor; but afterwards another being created, the first or chief one had the title of pretor urbanus, or the city-pretor; the other was called peregrinus, as being judge in all matters relating to foreigners. But, besides these, there were afterwards created many provincial pretors; who were not only judges, but also assisted the consuls in the government of the provinces, and even were invested with the government of provinces themselves.

PRETORIAN GUARDS, *prætoriæ cohortæ*, in roman antiquity, were the emperor's guards, who at length were increased to ten thousand; they had this denomination, according to some, from their being stationed at a place in the palace called prætorium: their commander was stiled præfectus prætorii. See the article PREFECT.

PRETORIUM, *prætorium*, among the Romans, denoted the hall or court wherein the pretor lived, and wherein he administered justice.

It likewise denoted the tent of the roman general, wherein councils of war, *&c.* were held: also a place in Rome, where the pretorian guards were lodged.

PREVARICATION, *prævaricatio*, in the civil-law, is where the informer colludes with the defendants, and so makes only a sham prosecution.

PREVARICATION, in our laws, is when a man falsely seems to undertake a thing, with intention that he may destroy it; where a lawyer pleads booty, or acts by collusion, *&c.*

It also denotes a secret abuse committed in the exercise of a public office, or of a commission given by a private person.

PREVARICATOR, *prævaricator*, at Cambridge, is a master of arts, chosen at

at a commencement, to make an ingenious fatirical fpeech reflecting on the mifdemeanors of the principal members.

PREVENTION, *præventio*, in the canon law, &c. the right which a fuperior perfon has to claim, or tranfact an affair, prior to an inferior one.

PREVESA, a port-town of Albania, or Epirus, fituated at the entrance of the gulph of Venice, 25 miles north of the ifland of Cephalonia: eaft long. 21° 15', north lat. 38° 45'.

PRIAMAN, a port-town of the ifland of Sumatra, and a dutch factory: eaft long. 98°, fouth lat. 1°.

PRIAPEIA, in poetry, certain obfcene epigrams, and other pieces, on the god Priapus in the greek catalecta.

PRIAPISM, πριαπισμος, in medicine, a continual and painful erection of the penis.

PRIAPUS, in medicine, denotes the genital parts in men.

It alfo denotes, in antiquity, a fabulous deity, particularly adored at Lampfacus, the place of his birth, who was revered very much for the extraordinary fize of his parts.

PRICKING, in the fea-language, is to make a point on the plat or chart, near about where the fhip then is, or is to be at fuch a time, in order to find the courfe they are to fteer. See NAVIGATION.

PRIEST, *facerdos*, a perfon fet apart for the performing of facrifice, and other offices of religion.

PRIEST, *prefbyter*, in the chriftian church, is a perfon invefted with holy orders; in virtue whereof he has a power to preach, pray, adminifter the facraments, &c. And in the romifh church alfo to blefs, abfolve, &c. See the article PRESBYTER, ORDINATION, CLERGY, &c.

PRIMÆ VIÆ, among phyficians, denote the whole alimentary duct; including the oefophagus, ftomach, and inteftines, with their appendages. See the articles OESOPHAGUS, STOMACH, and INTESTINES.

PRIMAGE, in commerce, a fmall duty at the water-fide, ufually about twelvepence per tun, or fix pence a bale, due to the mafter and mariners of a fhip; to the mafter, for the ufe of ropes, &c. to difcharge the goods; and to the mariners, for the loading or unloading of the veffel. See the article DUTY.

PRIMARY-PLANET, in aftronomy, one that revolves round the fun as a center. See the article PLANET.

PRIMATE, *primas*, in church-polity, an archbifhop, who is invefted with a jurifdiction over other bifhops. See the articles BISHOP, METROPOLITAN, &c.

Some make a diftinction between primate and metropolitan; the former having fome fort of preheminence over one or more archbifhops, and the latter only over fimple bifhops: thus the archbifhop of Canterbury is ftiled primate of all England, relating to adminiftrations, &c. which the archbifhop of York has only within his own province.

PRIME, *primus*, an appellation given to whatever is firft in order, degree, or dignity among feveral things of the fame or like kind; thus, we fay, the prime minifter, prime coft, &c.

Prime is fometimes ufed to denote the fame with decimal, or the tenth part of an unit. See the article DECIMAL.

In weights, it ftands for the twenty-fourth part of a grain. See the articles, WEIGHT and GRAIN.

Prime figure, in geometry, one which cannot be divided into any other figures more fimple than itfelf, as a triangle among planes, and the pyramid among folids. See the article FIGURE.

For prime numbers, in arithmetic. See the article NUMBER.

Prime of the moon is the new moon, when fhe firft appears, which is about three days after the change. See MOON.

Prime vertical is that vertical circle, which paffes through the poles of the meridian, or the eaft and weft points of the horizon; whence dials projected on the plane of this circle, are called prime vertical, or north and fouth dials. See the articles VERTICAL, DIAL, &c.

Prime, in the romifh church, is the firft of the canonical hours, fucceeding to lauds.

Prime, in fencing, is the firft chief of the guards. See the article GUARD.

PRIMICERIUS, in antiquity, the firft or chief perfons in any office or dignity.

PRIMIER SEISIN, in law, *prima feifina*, or firft feifin, a branch of the king's prerogative, whereby he had the firft poffeffion of all lands and tenements held of him in chief, whereof his tenant died feized in fee; and confequently the rents and profits thereof, till the heir, if of age, did homage; and, if under age, till he became of age. But all charges arifing hereby are annulled by ftat. 12 Car. II.

PRIMING, or *prime of a gun*, is the gunpowder put into the pan or touch-hole of a piece,

a piece, to give it fire thereby. And this is the laſt thing done in charging.

For pieces of ordnance, they have a pointed iron-rod, to pierce the cartridge through the touch-hole, called primer or priming-iron.

PRIMING, among painters, ſignifies the laying on of the firſt colour.

PRIMIPILUS, PRIMOPILUS, PRIMIPILI *centurio*, in antiquity, the centurion of the firſt cohort of a legion, who had charge of the roman eagle. See the article CENTURION.

Hence thoſe who had formerly borne the office of primipile, or firſt centurion of a legion, were called *primipilarii*, *primopilarii*, or *primipilares*; and among other privileges enjoyed by them, moſt of the ſoldiers who died in the campaign left them their heirs.

PRIMITIÆ, the firſt fruits gathered of the earth, whereof the antients made preſents to the gods.

In our law, the primitiæ are one year's profits, after avoidance of every ſpiritual living, as rated in the king's books. See the article ANNATES.

PRIMITIVE, in grammar, is a root or original word in a language, in contra-diſtinction to derivative: thus, *God* is a primitive, *godly* derivative, and *god-like* a compound.

PRIMO *Beneficio eccleſiaſtico habendo*, in law, a writ directed from the king to the lord-chancellor; appointing him to beſtow the benefice that ſhall firſt fall in the king's gift, above or under ſuch a value, upon this or that clerk.

PRIMOGENITURE, *primogenitura*, the right of the firſt born.

This right ſeems to be an unjuſt prerogative, and contrary to the natural right: for, ſince it is birth alone gives children a title to the paternal ſucceſſion, the chance of primogeniture ſhould not throw any inequality among them.

It was not till the race of Hugh Capet, that the prerogative of ſucceſſion to the crown was appropriated to the firſt-born. By the antient cuſtom of gavel kind, ſtill preſerved in ſome parts of our iſland, primogeniture is of no account, the paternal eſtate being equally ſhared among the ſons.

PRIMULA, or PRIMULA VERIS, the COWSLIP, in botany, a genus of the pentandria-monogynia claſs of plants, the flower of which conſiſts of one funnel-like petal, with a wide expanded limb, divided into five cordated ſegments: the fruit is a cylindric capſule, containing numerous roundiſh ſeeds. See plate CCVIII. fig. 3.

PRIMUM MOBILE, in the ptolemaic ſyſtem of aſtronomy. See MOBILE.

PRIMUM ENS. See the article ENS.

PRIMUS, in anatomy, an appellation given to ſeveral muſcles, of which there are more than one: thus primus brachii moventium is the ſame with the pectoralis; the primus oculum movens, with adductor or bibitorius, *&c.*

PRINCE, *princeps*, in polity, a perſon inveſted with the ſupreme command of a ſtate, independent of any other.

Prince alſo denotes a perſon who is a ſovereign in his own territories, yet holds of ſome other as his ſuperior; ſuch are the princes of Germany, who, though abſolute in their reſpective principalities, are bound to the emperor in certain ſervices.

Prince alſo denotes the iſſue of princes, or thoſe of the royal family. In France, they are called princes of the blood. In England the king's children are called ſons and daughters of England: the eldeſt ſon is created prince of Wales. The cadets are created dukes or earls as the king pleaſes. And the title of all the children is royal highneſs: all ſubjects are to kneel, when admitted to kiſs their hand, and at table, out of the king's preſence they are ſerved on the knee. It is high treaſon to violate the eldeſt daughter unmarried.

The prince of Wales is born duke of Cornwal, and immediately entitled to all the revenues belonging thereto. He is afterwards created prince of Wales by inveſtiture with a cap, coronet, gold-verge, and ring, and he holds it by patent. The title and principality were firſt given by Edw. I. to his eldeſt ſon. While Normandy remained to England, he was ſtiled duke of Normandy; but ſince the union, his title is Magnæ Britanniæ Princeps. He is reputed, in law, the ſame perſon with the king; to imagine his death, or violate his wife, is high treaſon.

PRINCE of the *ſenate* in old Rome, the perſon who was called over firſt in the roll of ſenators, whenever it was renewed by the cenſors: he was always of conſular and cenſorian dignity. See the article SENATE.

PRINCE *of the youth*, *princeps juventutis*, a title given to the ſucceſſor nominated by any of the roman emperors in their lifetime.

PRINCE'S

PRINCE'S FEATHER, in botany, the fame with amaranth. See AMARANTH.

PRINCE'S METAL. See METAL.

PRINCIPAL, *principalis*, the chief and moft neceffary part of a thing.

In commerce, principal is the capital of a fum due or lent, fo called in oppofition to intereft. See the article INTEREST.

It alfo denotes the firft fund put by partners into a common ftock, by which it is diftinguifhed from the calls or acceffions afterwards required.

PRINCIPAL *point*, in perfpective, is a point in the perfpective plane, upon which a line drawn from the eye perpendicular to the plane falls. It is in the interfection of the horizontal and vertical plane, and called the point of fight and point of the eye. See PERSPECTIVE.

PRINCIPAL-RAY, in perfpective, that which paffes perpendicularly from the fpectator's eye to the perfpective plane. See the article PERSPECTIVE.

PRINCIPAT, a province of the kingdom of Naples, fituated on the Mediterranean between the provinces of Lavoro and Calabria, and divided into the hither and further principat, with refpect to the city of Naples.

PRINCIPLE, *principium*, in general, is ufed for the caufe, fource, or origin of any thing.

Principles, in phyfics, are often confounded with elements, or the firft and fimpleft parts whereof natural bodies are compounded, and into which they are again refolvable by the force of fire. See the article ELEMENT.

It is impoffible to know the virtues of any body, or how mixed bodies of different kinds ftand related to the human body, either for the prefervation of its functions entire, the reftoring them when loft and impaired, or for the total deftruction thereof, till we know the principles of which they confift, and likewife the mixture and proportion of fuch principles in bodies, to which their effects are principally owing. Wherefore having difcovered, by various ways, the parts into which a true chemical analyfis refolves bodies, we muft look upon fuch fimple parts, into which all mixed bodies are capable of being refolved, and of which they feem to be compounded, as the true and genuine principles. The antients, having obferved, that, in analyfing all bodies whatever, they obtained a fpirit, or mercury, fulphur, falt, water, and earth, concluded the number of principles to be five.

If wine, for inftance, be diftilled in a a proper alembic, a burning-water, or fpirit, will firft arife; next, an infipid water, which they call phlegm, a thick vifcid mafs alone remaining in the ftill. This they put into another veffel or retort, which being expofed to a more intenfe heat, a fmall portion of phlegm comes over firft; then an acid water, which, according to them, is ftill fpirit or mercury; next, a fat oily fubftance called fulphur. What remains in the retort is burnt to afhes in an open fire. Thefe afhes are thrown into an earthen veffel, with a proper quantity of boiling water, which they impregnate with falt. This water being filtred through cap-paper, and afterwards evaporated, leaves the falt at the bottom. The other part of the afhes, which the water does not take up, is termed dead earth, or caput mortuum.

Of thefe five fubftances the chemifts have reckoned two to be paffive, water and earth; and three active, fpirit, fulphur, and falt; and on thefe laft they thought the whole virtue and efficacy of the mixed body depended. In this analyfis we may obferve, that there is a two-fold fpirit; one oily and inflammable, which rifes firft by a gentle heat, and is termed fpirit of wine; another acid and penetrating, like that of vinegar. Befides thefe, chemifts give the name of fpirit to other penetrating, volatile, or urinous liquors, obtained from the parts of animals, fuch as the fpirit of urine, hartfhorn, blood, and fuch like fubftances: but the later chemifts have banifhed thefe fpirits from the number of their principles, as being nothing elfe but fulphur, or falt diffolved in water. Thus fpirit of nitre, and others of that kind, are only acid falts in water; fpirit of hartfhorn, or urine, alcaline falts; and fpirit of wine, or of turpentine, an etherial attenuated oil.

Some of the moderns deny, likewife, that either fulphur or falt deferve the name of principles, or elements, as not being the moft fimple fubftances producible by chemiftry. For fulphur when treated with due care, may be refolved into falt, water, and earth, as is evident, by diftilling fetid diftilled oils feveral times with quick lime; which, by this treatment yield, in large quantities, a vola-

a volatile salt dissolved in phlegm, together with a caput mortuum, or earth. Likewise, etherial oils are only fat thick oils, like that of olives, attenuated by salts, and dissolved in water, as may be proved by the two following experiments: if oil of olives, or any other of that kind, be mixed with a fermenting liquor, such as a solution of honey in water, the whole will be converted into an inflammable spirit. And if a quart of spirit of wine, diluted with six quarts of common water, be exposed in a cold place to the open air, the volatile salts will fly off, and leave drops of oil swimming on the top, which are, in every respect, equal to oil of olives, or almonds.

Salt has no better title to a principle than sulphur, because it may, by proper management, be at length reduced to earth and water.

Water and earth, in the strictest sense deserve the name of principles. However in the formation of mixed bodies, a third principle must necessarily concur with them; for being unactive, they could never produce any thing, unless set in motion by an active principle, which, according to some, is nothing but fire. We acknowledge therefore, says Geoffroy, three simple substances, or principles, in bodies; one active, which may be termed fire; and two passive, water and earth. From the most simple union of these three, salt arises; and the next to that is sulphur, or oil. See the articles EARTH, WATER, FIRE, SALT, SULPHUR, &c.

PRINCIPLE is also sometimes used in a synonymous sense with axiom or maxim. See the articles AXIOM and MAXIM.

PRINOS, in botany, a genus of the hexandria-monogynia class of plants, with a monopetalous rotated flower, the limb of which is divided into six oval segments: the fruit is a roundish berry, containing six cells, with a single, osseous, obtuse seed in each.

PRINT, the impression taken from a copper-plate. See the article *Rolling-press* PRINTING.

A print may be taken off, so as that the out lines and principal strokes may be exactly copied for graving, in the following manner. If the print be not above a year or two old, the paper need only be well moistened with water, as for printing; but if it be more antient, it should be laid to soak all night in water, and afterward hung in the air till it becomes dry enough for the press. The paper thus prepared is to be laid with his printed side next the plate, thinly cased over with white wax; and is thus to be communicated to the rolling-press, whereby an impression of the cut will be gained.

Prints, except of India or China, on their being imported, pay a duty of $1\frac{43\frac{5}{8}}{100}$ d. the piece, drawback $1\frac{29\frac{3}{8}}{100}$ d.

PRINTER, a person who composes and takes impressions from moveable characters ranged in order, or front-plates engraven, by means of ink, and a press; or from blocks of wood cut in flowers, &c. and taken off in various colours on calicoes, linens, silks, &c.

The most curious of these arts, and that which deserves the most particular explication is the first; for to the printers of books are chiefly owing our deliverance from ignorance and error, the progress of learning, the revival of the sciences, and numberless improvements in arts, which without this noble invention would have been either lost to mankind, or confined to the knowledge of a few. The first printers were Guttemberg, Fust, Schoeffer, Mentel, and Koster; and the first who practised this art in England was Fred. Corseilles, who brought it over from Harlem, in the reign of king Henry VI. The great printers famous for the correctness and elegance of their works, were Aldus, and Paulus Manutius; the two Badii; William and Frederic Morel; Oporin; Frobenius; Robert Henry, and Charles Stephens; Gryphius, Turnebus, Torres, Commelin, Plantin, Raphelengius, Vascosan, Bleau, Crispin, and the two Elzevirs; and among these, the learned printers were the Manutii, the Stephenses, the Bodii, Turnebus, Morel, &c. Plantin had the title of architypographus, or arch-printer, given him by the king of Spain in consideration of his printing the polyglot of Antwerp. The printers of Germany, &c. generally cast their own letter, and sell their own books: these are in many places ranked among the members of universities, and entitled to the privilege of students: in England, they are esteemed a part of the company of stationers and booksellers. See the article BOOKSELLER.

PRINTING, the art of taking impressions from characters or figures moveable, or

or immoveable, on paper, linen, ſilk, *&c.* There are three kinds of printing, the one from moveable letters for books; an other from copper-plates for pictures; and the laſt from blocks, in which the repreſentation of birds, flowers, *&c.* are cut for printing calicoes, linens, *&c.* the firſt, called common preſs-printing, the ſecond rolling preſs-printing, and the laſt calicoe, *&c.* printing. The principal difference between the three conſiſts in this, that the firſt is caſt in relievo in diſtinct pieces, the ſecond engraven in creux, and the third cut in relievo, and generally ſtamped, by placing the block upon the materials to be printed, and ſtriking upon the back of it.

Progreſs of PRINTING. Who the firſt inventors of the european method of printing books were, in what city and what year it was ſet on foot, are queſtions long diſputed among the learned. In effect, as the grecian cities contended for the birth of Homer, ſo do the german cities for that of printing. Mentz, Haerlem, and Straſburg, are the warmeſt on this point of honour, and theſe are left in poſſeſſion of the queſtion, which is not yet decided: though it muſt be owned that Mentz has always had the majority of voices. John Guttemburg, and John Fuſt of Mentz; John Mentel of Straſburg, and L. John Koſter of Haerlem, are the perſons to whom this honour is ſeverally aſcribed, by their reſpective countrymen; and they have all their advocates among the learned. However, their firſt eſſays were made on wooden blocks, after the chineſe manner. The book at Haerlem, the vocabulary called Catholicon, and the pieces in the Bodleian library, and that of Bennet-college, are all performed in this way; and the impreſſion appears to have been only given on one ſide of the leaves; after which the two blank ſides were paſted together. But they ſoon found the inconveniencies of this method, and therefore bethought themſelves of an improvement; which was by making ſingle letters diſtinct from one another, and theſe being firſt done in wood, gave room for a ſecond improvement, which was the making them of metal; and, in order to that, forming moulds, matrices, *&c.* for caſting them. See LETTER.

From this ingenious contrivance we ought to date the origin of the preſent art of printing, contradiſtinguiſhed from the method practiſed by the Chineſe. And of this Schoeffer, or Scheffer, firſt ſervant, and afterwards partner and ſon-in-law of Fuſt, at Mentz, above-mentioned, is pretty generally allowed to be the inventor: ſo that he may properly be reckoned the firſt printer, and the Bible, which was printed with moveable letters in 1450, the firſt printed book; the next was Auguſtine de civitate dei, then Tully's Offices, printed about the year 1461. In theſe books they left the places of the initial letters blank, and gave them to the illuminers to have them ornamented and painted in gold and azure, in order to render the work more beautiful, and, as ſome think, to make their books paſs for manuſcripts. Thus at preſent, in ſome curious works, the initial letter at the beginning of a book, or chapter, is ſometimes left out, and a ſpace is left for its being afterwards printed with various ornaments from a copper-plate.

Some authors tell us, that Fuſt carrying a parcel of Bibles with him to Paris, and offering them to ſale as manuſcripts; the French, upon conſidering the number of books, and their exact conformity to each other, even to a point, and that it was impoſſible for the beſt book-writers to be ſo exact, concluded there was witchcraft in the caſe, and, by their actually indicting him as a conjurer, or threatening to do ſo, extorted from him the ſecret: and hence the origin of the popular ſtory of Dr. Fauſtus.

From Mentz, the art of printing ſoon ſpread itſelf throughout a good part of Europe; Haerlem and Straſburg had it very early; which as the current of authors repreſent it, occaſioned their pretending to the honour of the invention. From Haerlem it paſſed to Rome in 1467; and into England in 1468, by means of Tho. Bourchier, archbiſhop of Canterbury, who ſent W. Turner, maſter of the robes, and W. Caxton, merchant, to Haerlem to learn the art. Theſe privately prevailing with Corſeilles, an under-workman, to come over, a preſs was ſet up at Oxford, and an edition of Ruffinus on the creed was printed the ſame year in octavo. From Oxford, Caxton brought it to London about the year 1470, and the ſame year it was carried to Paris. Hitherto there had been nothing printed but in latin, and the vulgar tongues; and this firſt in roman characters, then in gothic, and at laſt in italic: but in 1480, the Italians caſt a

ſe

fet of greek types, and they have alfo the honour of the firft Hebrew editions which were printed about the fame time with the greek. Towards the end of the fixteenth century there appeared various editions of books in fyriac, arabic, perfian, armenian, coptic or egyptian characters, fome to gratify the curiofity of the learned, and others for the ufe of the chriftians of the Levant. Out of Europe, the art of printing has been carried into the three other parts of the world: for Afia, we fee impreffions of books at Goa, and in the Philippines; at Morocco, for Africa; at Mexico, Lima, Philadelphia, New York, Bofton, &c. for America. The Turks, indeed, rigoroufly prohibit printing throughout their empire, as imagining that the too frequent communication with books might occafion fome change in their religion and government; yet the Jews have feveral editions of their books printed at Theffalonia, and even at Conftantinople.

Method of Printing. The printing-letters or types, as they are fometimes called, we have already taken notice of, and have defcribed the method of forming and cafting them under the articles Letter and *Letter*-Foundery.

The workmen employed in the art of printing are of two kinds; compofitors, who range and difpofe the letters into words, lines, pages, &c. according to the copy delivered them by the author; and preffmen, who apply ink upon the fame, and take off the impreffion. The types being caft, the compofitor diftributes each kind by itfelf among the divifions of two wooden frames, an upper and an under one, called cafes; each of which is divided into little cells or boxes. Thofe of the upper cafe are in number ninety-eight; thefe are all of the fame fize, and in them are difpofed the capitals, fmall-capitals, accented letters, figures, &c. the capitals being placed in alphabetical order. In the cells of the lower cafe, which are fifty-four, are placed the fmall letters with the points, fpaces, &c. The boxes are here of different fizes, the largeft being for the letters moft ufed; and thefe boxes are not in alphabetical order, but the cells which contain the letter ofteneft wanted, are neareft the compofitor's hand. Each cafe is placed a little aflope, that the compofitor may the more eafily reach the upper boxes. The inftrument in which the letters are fet is called a compofing-ftick, fee plate CCX. fig. 3. n° 2. which confifts of a long and, narrow plate of brafs or iron, &c. *c c*, on the right-fide of which arifes a ledge *b b*, which runs the whole length of the plate, and ferves to fuftain the letters, the fides of which are to reft againft it: along this ledge is a row of holes, which ferve for introducing the fcrew *f*, in order to lengthen or fhorten the extent of the line, by moving the fliders *e*, *d*, farther from, or nearer to the fhorter ledge at the end *a*. Where marginal notes are required in a work, the two fliding-pieces, *e*, *d*, are opened to a proper diftance from each other; in fuch a manner as that while the diftance between *d* and *c* forms the length of the line in the text, the diftance between the two fliding-pieces forms the length of the lines for the notes on the fide of the page. Before the compofitor proceeds to compofe, he puts a rule, or thin flip of brafs-plate, cut to the length of the line, and of the fame height as the letter, in the compofing-ftick, againft the ledge, for the letter to bear againft. Things thus prepared, the compofitor having the copy lying before him, and his ftick in his left-hand, his thumb being over the flider *d*; with the right, he takes up the letters, fpaces, &c. one by one, and places them againft the rule, while he fupports them with his left thumb by preffing them to the end of the flider *d*; the other hand being conftantly employed in fetting in other letters: the whole being performed with a degree of expedition and addrefs not eafy to be imagined.

A line being thus compofed, if it end with a word or fyllable, and exactly fill the meafure, there needs no further care; otherwife more fpaces are to be put in, or elfe the diftances leffened between the feveral words, in order to make the meafure quite full; fo that every line may end even. The fpaces here ufed are pieces of metal exactly fhaped like the fhanks of the letters; thefe are of various thickneffes, and ferve to fupport the letters, and to preferve a proper diftance between the words; but not reaching fo high as the letters, they make no impreffion when the work is printed. The firft line being thus finifhed, the compofitor proceeds to the next; in order to which he moves the brafs-rule from behind the former, and places it before it, and thus compofes another line againft it after the fame manner as before; going

going on thus till his ftick is full, when he empties all the lines contained in it into the gally. See the article GALLY.

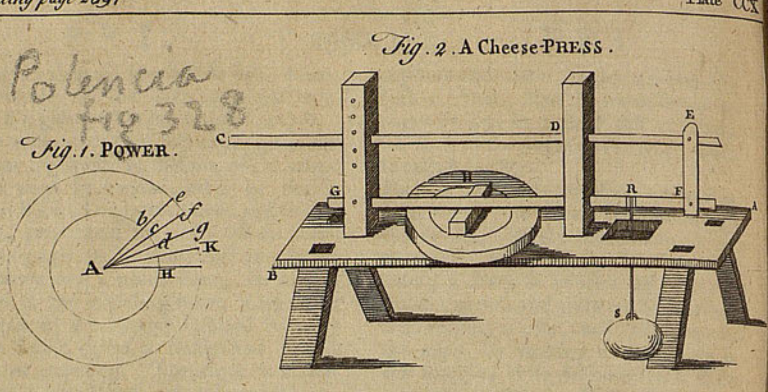
The compofitor then fills and empties his compofing-ftick, as before, till a complete page be formed, when he ties it up with a cord or pack-thread, and fetting it by, proceeds to the next, till the number of pages to be contained in a fheet is completed: which done, he carries them to the impofing-ftone, there to be ranged in order, and faftened together in a frame called a chafe, and this is termed impofing. The chafe is a rectangular iron-frame, of different dimenfions, according to the fize of the paper to be printed, having two crofs pieces of the fame metal, called a long and fhort crofs, mortifed at each end fo as to be taken out occafionally. By the different fituation of thefe croffes the chafe is fitted for different volumes: for quartos and octavos, one traverfes the middle lengthwife, the other broadwife, fo as to interfect each other in the center: for twelves and twenty-fours, the fhort crofs is fhifted nearer to one end of the chafe: for folios, the long crofs is left entirely out, and the fhort one left in the middle; and for broad-fides, both croffes are fet afide.

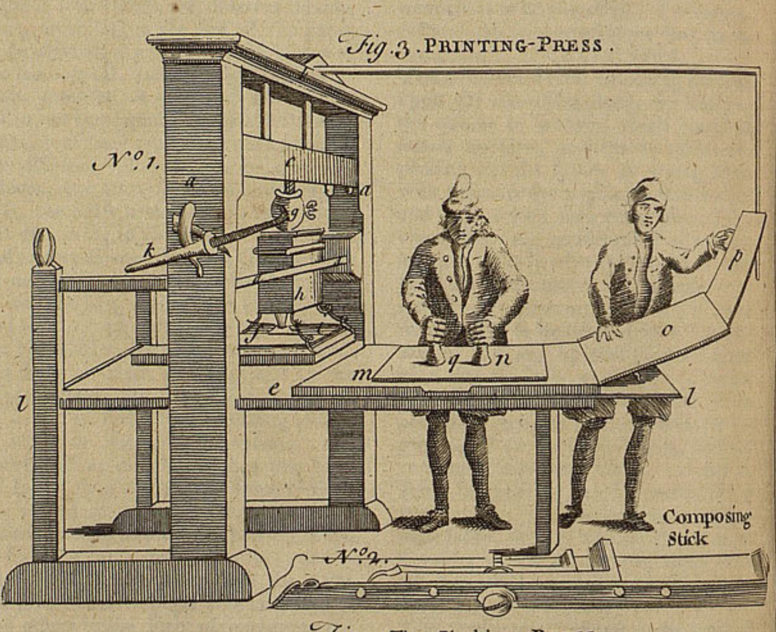
To drefs the chafe, or range and fix the pages therein, the compofitor makes ufe of a fet of furniture, confifting if flips of wood of different dimenfions, and about half an inch high, that they may be lower than the letters: fome of thefe are placed at the top of the pages, and called head-fticks; others between them to form the inner margin; others on the fides of the croffes to form the outer margin, where the paper is to be doubled; and others in the form of wedges to the fides and bottom of the pages. Thus all the pages being placed at their proper diftances, and fecured from being injured by the chafe and furniture placed about them, they are all untied, and faftened together by driving fmall pieces of wood called quoins, cut in the wedge-form, up between the flanting fide of the foot and fide-fticks and the chafe, by means of a piece of hard wood and a mallet, and all being thus bound faft together, fo that none of the letters will fall out, it is ready to be committed to the preffman. In this condition the work is called a form; and as there are two of thefe forms required for every fheet, when both fides are to be printed, it is neceffary the diftances between the pages in each form fhould be placed with fuch exactnefs, that the impreffion of the pages in one form fhall fall exactly on the back of the pages of the other, which is called regifter.

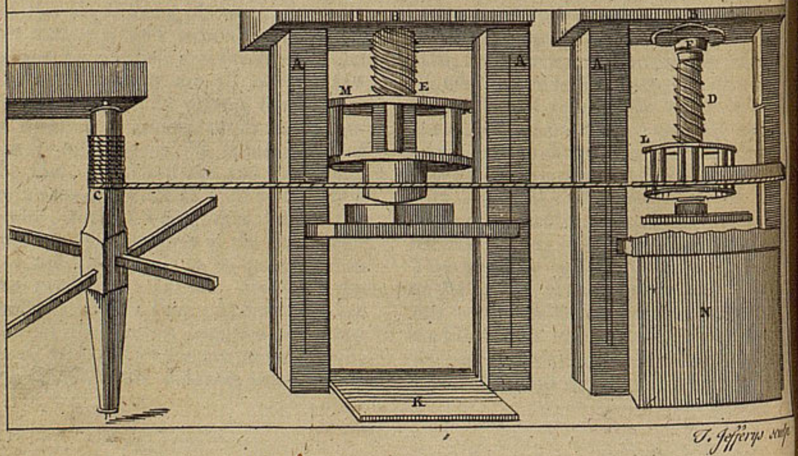
As it is impoffible but that there muft be fome miftakes in the work, either through the overfight of the compofitor, or by the cafual tranfpofition of letters in the cafes; a fheet is printed off, which is called a proof, and given to the corrector; who reading it over, and rectifying it by the copy, by making the alterations in the margin, it is delivered back to the compofitor to be corrected. For the characters ufed in correcting a fheet for the compofitor, fee CORRECTION.

The compofitor then unlocking the form upon the correcting-ftone, by loofening the quoins or wedges which bound the letters together, rectifies the miftakes by picking out the faulty or wrong letters with a flender fharp-pointed fteel-bodkin, and puts others into their places; but when there are confiderable alterations, and particularly where infertions or omiffions are to be made, he is under a neceffity of over-running. Thus, if one or more words to be inferted in a line cannot be got in, by changing the fpaces of a line for leffer ones, part of the line muft be put back into the clofe of the preceding one, or forward into the beginning of the fubfequent one, and this continued till the words are got in. After this another proof is made, fent to the author, and corrected as before; and, laftly, there is another proof, called a revife, which is made in order to fee whether all the miftakes marked in the laft proof are corrected.

The preffman's bufinefs is to work off the forms thus prepared and corrected by the compofitor; in doing which there are four things required, paper, ink, balls, and a prefs. To prepare the paper for ufe, it is to be firft wetted by dipping feveral fheets together in water: thefe are afterwards laid in a heap over each other; and to make them take the water equally, they are all preffed clofe down with a weight at the top. The ink is made of oil and lamp-black, for the manner of preparing which, fee *Printing*-INK. The balls by which the ink is applied on the forms, are a kind of wooden funnels with handles, the cavities of which are filled with wool or hair, as is alfo a piece of alum-leather or pelt nailed over the cavity, and made extremely foft by foaking







T. Jefferys sculp.

ſoaking in urine, and by being well rubbed. One of theſe the preſſman takes in each hand, and applying one of them to the ink-block, dabbs and works them together to diſtribute the ink equally, and then blackens the form which is placed on the preſs, by beating with the balls upon the face of the letter.

The printing-preſs repreſented in plate CCX. fig. 3. n° 1. is a very curious though complex machine; the body conſiſts of two ſtrong cheeks *a a*, placed perpendicularly, and joined together by four croſs-pieces; the cap *b*; the head *c*, which is moveable, being partly ſuſtained by two iron-pins, or long bolts, that paſs the cap; the ſhelves *dd*, which ſerve to keep ſteady a part called the hoſe, and the winter *e*, which bears the carriage, and ſuſtains the effort of the preſs beneath. The ſpindle *f* is an upright piece of iron pointed with ſteel, having a male-ſcrew which goes into the female one in the head about four inches. Through the eye *g* of this ſpindle is faſtened the bar *k*, by which the preſſman makes the impreſſion. Part of the ſpindle is incloſed in a ſquare wooden frame called the hoſe, *h*, and its point works into a braſs-pan ſupplied with oil, which is fixed to an iron-plate let into the top of the platten. At each corner of the hoſe, there is an iron-hook faſtened with pack-thread to thoſe at each end of the platten *i*, in ſuch a manner as to keep it perfectly level. The carriage *l l* is placed a foot below the platten, having its fore-part ſupported by a prop called the fore-ſtay, while the other reſts on the winter. On this carriage, which ſuſtains the plank, are nailed two long iron-bars or ribs, and on the plank are nailed ſhort pieces of iron or ſteel called cramp-irons, equally tempered with the ribs, and which ſlide upon them when the plank is turned in or out. Under the carriage is fixed a long piece of iron called the ſpit, with a double wheel in the middle, round which leather girts are faſtened, nailed to each end of the plank; and to the outſide of the ſpit is fixed a rounce *m*, or handle to turn round the wheel. Upon the plank is a ſquare frame or coffin, in which is incloſed a poliſhed ſtone on which the form *n* is laid; at the end of the coffin are three frames, *viz.* the two tympans and friſket: the tympans *o* are ſquare, and made of three ſlips of very thin wood, and at the top a piece of iron ſtill thinner; that called the outer tympan faſtened with hinges to the coffin: they are both covered with parchment; and between the two are placed blankets, which are neceſſary to take off the impreſſion of the letters upon the paper. The friſket *p* is a ſquare frame of thin iron, faſtened with hinges to the tympan; it is covered with paper cut in the neceſſary places, that the ſheet, which is put between the friſket and the great or outward tympan, may receive the ink, and that nothing may hurt the margins. To regulate the margins, a ſheet of paper is faſtened upon this tympan, which is called the tympan-ſheet, and on each ſide is fixed an iron-point, which makes two holes in the ſheet, which is to be placed on the ſame points, when the impreſſion is to be made on the other ſide. In preparing the preſs for working, the parchment which covers the outer tympan is wetted till it is very ſoft, in order to render the impreſſion more equable; the blankets are then put in, and ſecured from ſlipping by the inner tympan; then while one preſſman is beating the letter with the balls *q*, covered with ink taken from the ink-block: the other perſon places a ſheet of white paper on the tympan-ſheet, turns down the friſket upon it to keep the paper clean and prevent its ſlipping; then bringing the tympans upon the form, and turning the rounce, he brings the form with the ſtone, &c. weighing about 300 pounds weight, under the platten; pulls with the bar, by which means the platten preſſes the blankets and paper cloſe upon the letter, whereby half the form is printed; then eaſing the bar, he draws the form ſtill forward, gives a ſecond pull, and letting go the bar, turns back the form, takes up the tympans and friſket, takes out the printed ſheet and lays on a freſh one; and this is repeated till he has taken off the impreſſion upon the full number of ſheets the edition is to conſiſt of. One ſide of the ſheet being thus printed, the form for the other is laid upon the preſs, and worked off in the ſame manner.

Chineſe PRINTING is performed from wooden planks or blocks, cut like thoſe uſed in printing of callico, paper, cards, &c. for the uſe of which, ſee the article LETTER.

This kind of printing is generally allowed to be of very great antiquity. Their blocks are made of ſmooth, cloſe wood, of the ſize of the leaf required, and the copy being fairly wrote on chi-

nefe paper, is ftruck with the writing downwards on the fmooth fide of the wood, and then given to the fculptor, or cutter in wood; who cuts out all that is to remain white, and leaves only the lines of the writing, which when the work is finifhed remain in relievo, after which they rub off all remains of the paper. This is fmeared over with chinefe or indian-ink mixed with water, which is the fame they ufe in writing, and the paper being laid upon the block is preffed clofe to it, and the impreffion taken off by rolling over it a wooden cylinder with a handle at each end, and is rendered foft, and proper to give the impreffion, by its being covered with a piece of foft cotton ftuff rolled round it.

Rolling-prefs-PRINTING is employed in taking off prints or impreffions from copper plates engraven, etched, or fcraped as in mezzotintos. See ENGRAVING *on copper*, ETCHING, and MEZZOTINTO. This art is faid to have been as antient as the year 1540, and to owe its origin to Finiguerra, a florentine goldfmith, who pouring fome melted brimftone on an engraven plate, found the exact impreffion of the engraving left in the cold brimftone, marked with black taken out of the ftrokes by the liquid fulphur: upon this he attempted to do the fame on filver-plates with wet paper, by rolling it fmoothly with a roller; and this fucceeded: but this art was not ufed in England till the reign of king James I. when it was brought from Antwerp by Speed. The form of the rolling-prefs, the compofition of the ink ufed therein, and the manner of applying both in taking off prints, are as follow.

The rolling-prefs A L (plate CCXI. fig. 1.) may be divided into two parts, the body and carriage: the body confifts of two wooden cheeks, P, P, placed perpendicularly on a ftand or foot, L M, which fuftains the whole prefs. From the foot likewife arife four other perpendicular pieces *c*, *c*, *c*, *c*, joined by other crofs or horizontal ones, *d*, *d*, *d*, which ferve to fuftain a fmooth even plank or table H I K, about four feet and a half long, two feet and a half broad, and an inch and a half thick. Into the cheeks go two wooden cylinders or rollers, D E, F G, about fix inches in diameter, borne up at each end by the cheeks, whofe ends, which are leffened to about two inches diameter, and called trunnions, turn in the cheeks about two pieces of wood in form of half-moons, lined with polifhed iron to facilitate the motion. Laftly, to one of the trunnions of the upper roller is faftened a crofs, confifting of two levers, A, B, or pieces of wood, traverfing each other, the arms of which crofs ferve inftead of the bar or handle of the letter-prefs, by turning the upper roller, and when the plank is between the two rollers, giving the fame motion to the under one, by drawing the plank forward and backward.

The ink ufed for copper plates, is a compofition made of the ftones of peaches and apricots, the bones of fheep, and ivory, all well burnt, and called Frankfort-black, mixt with nut-oil that has been well boiled, and ground together on a marble, after the fame manner as painters do their colours.

The method of printing from copper-plates is as follows: they take a fmall quantity of this ink on a rubber made of linen-rags, ftrongly bound about each other, and therewith fmear the whole face of the plate as it lies on a grate over a charcoal-fire. The plate being fufficiently inked, they firft wipe it over with a foul rag, then with the palm of the left hand, and then with that of the right; and to dry the hand and forward the wiping, they rub it from time to time on whiting. In wiping the plate perfectly clean, yet without taking the ink out of the engraving, the addrefs of the workman confifts. The plate thus prepared, is laid on the plank of the prefs; over the plate is laid the paper, firft well moiftened, to receive the impreffion, and over the paper two or three folds of flannel. Things thus difpofed, the arms of the crofs are pulled, and by that means, the plate with its furniture, paffed through between the rollers, which pinching very ftrongly, yet equally, preffes the moiftened paper into the ftrokes of the engraving, whence it licks out the ink.

PRIOR, in general, fomething before or nearer the beginning than another, to which it is compared.

PRIOR, more particularly, denotes the fuperior of a convent of monks, or the next under the abbot. See ABBOT.

Priors are either clauftral or conventual. Conventual priors are the fame as abbots. Clauftral prior is he who governs the religious of an abbey or priory in commendam, having his jurifdiction wholly from the abbot.

Grand PRIOR, is the fuperior of a large abbey,

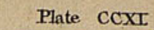
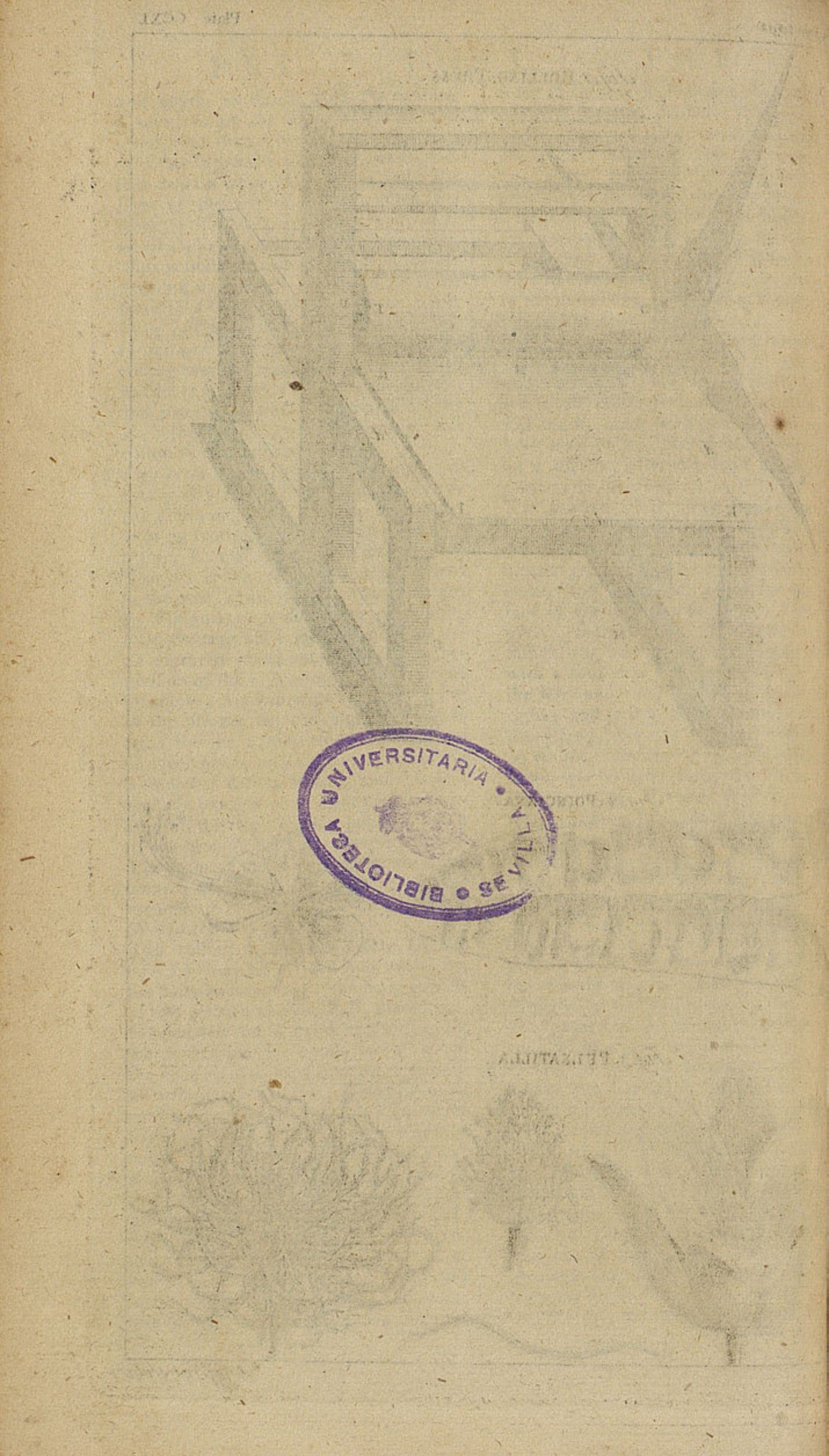


Fig. 1. ROLLING-PRESS.

Fig. 2. POINCIANA.

Fig. 3. PULSATILLA.

T. Jefferys sculp.



abbey, where several superiors are required.

PRIORITY, *prioritas*, the relation of something considered as prior to another. The principal modes of priority are five, in respect of time, nature, order, dignity, and causality, as summed up in this distich:

Tempore, natura, prius ordine, dic & honore
Effecto causam dicimus esse prius.

PRIORITY, in law, denotes an antiquity of tenure, in comparison of another less antient.

Where a prior suit is depending, it may be pleaded in abatement of a subsequent action; and a prior mortgage ought to be first paid off: but it is held, there is no priority of trial in judgments; for that which is first executed shall be first satisfied.

PRISAGE, *prisagium*, that part or share which belongs to the king, or admiral, out of prizes taken at sea from an enemy: this is usually a tenth part. See the article PRIZE.

PRISAGE *of wines*, a term antiently used for what is now called butlerage. See the article BUTLERAGE.

PRISCILLIANISTS, in church history, christian heretics, so called from their leader Priscillian, a Spaniard by birth, and bishop of Avila. He is said to have practised magic, and to have maintained the principal errors of the manichees; but his peculiar tenet was, that it is lawful to make false oaths, in order to support one's cause and interests.

PRISE, or PRIZE. See PRIZE.

PRISM, in geometry, an oblong solid, contained under more than four planes whose bases are equal, parallel, and alike situated.

The prism is generated by the motion of a rectilinear figure, as A B C, (plate CCIX. fig. 4.) descending always parallel to itself, along the right line A E.

If the describent be a triangle, the body is said to be a triangular prism; if square, a quadrangular one, *&c.*

From the genesis of the prism, it is evident it has two equal and opposite bases A B C and E D F; and it is terminated by as many parallelograms as the base consists of sides; and that all the sections of a prism parallel to its base are equal. Every triangular prism may be divided into three equal pyramids.

To measure the surface of any prism, find the area of each side, whether a triangle, parallelogram, or other rectilinear figure, as directed under these articles, and the sum of all these, taken together, is the whole superficies of the prism.

The solid content of a given prism may be found thus: let the area of the base of the prism be measured, as directed under the article TRIANGLE; and let this area be multiplied by the height of the prism, and the product will give the solid content of the prism.

PRISM, in dioptrics, a triangular glass-prism, much used in experiments about the nature of light and colours. See the articles LIGHT and COLOUR.

PRISMOID, *prismoides*, in geometry, a solid figure bounded by several planes, whose bases are right-angled parallelograms, parallel, and alike situated.

PRISON, a gaol, or place of confinement. See the article GAOL.

Lord Coke observes, that a prison is only a place of safe-custody, *salva custodia*, not a place of punishment. Any place where a person is confined may be said to be a prison: and when a process is issued against one, he must, when arrested thereon, either be committed to prison, or be bound in a recognizance with sureties, or else give bail, according to the nature of the case, to appear at a certain day in court, there to make answer to what is alledged against him. Where a person is taken and sent to prison, in a civil case, he may be released by the plaintiff in the suit; but if it be for treason, or felony, he may not regularly be discharged until he is indicted of the fact and acquitted. See the article INDICTMENT, and the next article.

PRISONER, a person restrained or kept in prison upon an action civil or criminal, or upon commandment: and one may be a prisoner on matter of record or matter of fact. A prisoner upon matter of record, is he who, being present in court, is by the court committed to prison; and the other is one carried to prison upon an arrest, whether it be by the sheriff, constable, or other officer.

It is held, that the court of king's bench has authority to send for a prisoner out of the Marshalsea prison by rule of court; but it cannot send for a prisoner out of any other prison without a writ of habeas corpus. Each judge of the king's bench may remit prisoners, together with their

their indictments, to the places where the offences with which they are charged were committed; and likewife a prifoner for debt may be removed from the Fleet-prifon to the King's-bench, and thence to the Marfhalfea, on fomething charged againft him in the habeas corpus or return, or on bringing the perfon into court.

Prifoners in the king's-bench and Fleet-prifons, on mefne procefs, *&c.* are actually to be confined within thefe prifons, or the rules of the fame, till they are difcharged: and in cafe they are not fo confined, the profits of the marfhals and wardens will be liable to fequeftration for the payment of a debt on judgment upon an efcape, befides the common remedy.

For the eafe of prifoners it is ordered, that thofe in the King's-bench fhall not pay above two fhillings and fix pence per week chamber-rent: and likewife, whilft any prifoner is kept in clofe cuftody, the gaoler, or keeper, is obliged to give him fuftenance, and not fuffer any one to die for want. Alfo, by ftat. 11 Geo. II. c. 20. it is enacted, that juftices of peace, in their feffions, may rate every parifh in their county, not exceeding a fmall weekly fum, to be annually paid towards the relief of poor prifoners. There are alfo frequent acts of grace for fetting at liberty infolvent debtors.

PRISTINA, a town of european Turky, in the province of Servia, feventy miles north eaft of Ragufa: eaft long. 20°, north lat. 43° 15′.

PRISTIS, the SAW FISH. See the article SAW-FISH.

PRIVATEERS, in maritime affairs, a kind of private fhips of war, fitted out by private perfons at their own expence; who have leave granted them to keep what they can take from the enemy, allowing the admiral his fhare. See the article LETTER *of Marque.*

Privateers muft give bond not to break treaties fubfifting with the crown, not to ufe their captives ill, not to commit any fpoil or depredation on the fhips of friends or neuters, *&c.* and not to bring away any fervants, *&c.* from America, without leave.

PRIVATION, in general, denotes the abfence or want of fomething; in which fenfe, darknefs is only a privation of light. See the article LIGHT.

PRIVATION, or rather DEPRIVATION, in the canon-law. See the article DEPRIVATION.

PRIVATIVE, in grammar, a particle which, when prefixed to a word, changes it into a contrary fenfe.

Among the Greeks the α is ufed as a privative, and among the Latins, *in.* The Englifh, French, *&c.* borrow both the greek and latin privatives.

PRIVATIVE QUANTITY, or NEGATIVE QUANTITY, in algebra, denotes a quantity lefs than nothing, in oppofition to affirmative or pofitive; and is expreffed by the fign (—) minus, prefixed thereto. See the article QUANTITY.

PRIVET, *liguftrum,* in botany. See the article LIGUSTRUM.

PRIVILEGE, in law, fome peculiar benefit granted to certain perfons or places, contrary to the ufual courfe of the law.

Privileges are faid to be perfonal or real. Perfonal privileges are fuch as are extended to peers, embaffadors, members of parliament and of the convocation, and their menial fervants, *&c.* See the article PEER, EMBASSADOR, PARLIAMENT, *&c.*

A real privilege is that granted to fome particular place; as the king's palace, the courts at Weftminfter, the univerfities, *&c.* See PALACE, COURT, UNIVERSITY, *&c.*

PRIVY, in law, denotes one who is partaker, or has an intereft in an affair.

Coke mentions four privies; privies in blood, as the heir to his father; privies in reprefentation, as executors and adminiftrators to the deceafed; privies in eftate, as he in reverfion and he in remainder; donor and donee, leffor and leffee; laftly, privy in tenure, as the lord by efcheat.

PRIVY-COUNCIL. See the article *Privy-*COUNCIL.

PRIVY-SEAL. See the article SEAL.

PRIZE, or PRISE, in maritime affairs, a veffel taken at fea from the enemies of a ftate, or from pirates; and that either by a man of war, a privateer, *&c.* having a commiffion for that purpofe.

Veffels are looked on as prize, if they fight under any other ftandard than that of the ftate from which they have their commiffion; if they have no charter-party, invoice, or bill of lading a-board; if loaded with effects belonging to the king's enemies, or with contraband goods.

Thofe of the king's fubjects recovered from

from the enemy, after remaining twenty-four hours in their hands, are deemed lawful prize.

Veſſels that refuſe to ſtrike, may be conſtrained; and if they make reſiſtance and fight, become lawful prize, if taken.

If ſhips of war, the prizes are to be divided among the officers, ſeamen, &c. as his majeſty ſhall appoint by proclamation; but among privateers, the diviſion is according to the agreement between the owners.

By ſtat. 13 Geo. II. c. 4. Judges and officers, failing of their duty, in reſpect to the condemnation of prizes, forfeit five hundred pounds, with full coſts of ſuit; one moiety to the king, and the other to the informer.

PROBABILITY is nothing but the appearance of the agreement or diſagreement of two ideas by the intervention of proofs whoſe connection is not conſtant and immutable, or is not perceived to be ſo; but is, or appears for the moſt part to be ſo; and is enough to induce the mind to judge the propoſition to be true or falſe, rather than the contrary.

Of probability there are degrees from the neighbourhood of certainty and demonſtration, quite down to improbability and unlikeneſs, even to the confines of impoſſibility; and alſo degrees of aſſent, from certain knowledge, and, what is next to it, full aſſurance and confidence, quite down to conjecture, doubt, diſtruſt, and diſbelief.

That propoſition then is probable for which there are arguments or proofs to make it paſs or be received for true. Probability being then to ſupply the defect of our knowledge, is always converſant about a thing whereof we have no certainty, but only ſome inducements to receive it for true. The grounds of it are in ſhort theſe two following:

Firſt, the conformity of any thing with our own knowledge, experience, or obſervation.

Secondly, the teſtimony of others vouching their obſervation and experience. In the teſtimony of others, is to be conſidered, 1. the number; 2. the integrity; 3. the ſkill of the witneſſes; 4. the deſign of the author, if it be a teſtimony cited out of a book; 5. the conſiſtency of the parts and circumſtances of the relation; 6. contrary teſtimonies. The mind, before it rationally aſſents or diſſents to any probable propoſition, ought to examine all the grounds of probability, and ſee how they make more or leſs for or againſt it; and, upon a due balancing the whole, reject or receive it, with a more or leſs firm aſſent, according to the preponderancy of the greater grounds of probability, on one ſide, or the other.

PROBABILITY, in poetry, the appearance of truth in the fable or action of a poem. See the articles DRAMA, FABLE, EPIC, POETRY, &c.

PROBATE of a will or teſtament, in law, is the exhibiting and proving of laſt wills and teſtaments before the eccleſiaſtical judge delegated by the biſhop who is ordinary of the place where the party died.

If all the goods and chattels of the deceaſed, as well as debts owing to him, are in the ſame dioceſe, the biſhop of that dioceſe is intitled to the probate of the will; but if ſuch perſonal eſtate, or effects, are diſperſed in ſeveral dioceſſes, ſo that there be five pounds out of the dioceſe where the party lived, in that caſe the archbiſhop of Canterbury or York becomes ordinary.

A probate may be made two ways, either in common form, or *per teſtes*; the proof in common form is only by the oath of the executor, or party exhibiting the will, who ſwears to his belief, that the will by him exhibited is the laſt will and teſtament of the deceaſed. The proof *per teſtes* is, when beſides his own oath he produces witneſſes, or makes other proof, and that in the preſence of ſuch perſons as may claim any intereſt in the goods of the deceaſed, or at leaſt in their abſence, after they have been duly ſummoned to ſee the will proved, if they think fit; which latter courſe is generally followed where there is fear of contention.

PROBATION, in the univerſities, is the examination and trial of a ſtudent who is about to take his degrees.

PROBATION, in a monaſtic ſenſe, ſignifies the year of novitiate which a religious muſt paſs in a convent, to prove his virtue and vocation, and whether he can bear the ſeverities of the rule.

PROBATIONER, in the church of Scotland, a ſtudent in divinity, who bringing a certificate from a profeſſor in an univerſity of his good morals, and his having performed his exerciſes to approbation, is admitted to undergo ſeveral trials. The trials of probationers are private

before

before a presbytery, and public before a congregation, the presbytery being present. The private trials are an homily or two, and an exegesis; that is, a theological subject is given in to the presbytery in theses, and the probationer answers any objections which any minister in the presbytery makes against those theses. They also examine him on his knowledge of the greek and latin languages, &c. The public trials are a popular sermon, and an exercise and addition; that is, a text is handled half an hour logically and critically, and for half an hour more practically.

If in all these he gains the approbation of the presbytery, he signs the confession of faith, and promises obedience to the judicatories of the kirk; upon which he receives a licence to preach.

PROBATOR, in law, one who undertakes to prove a crime charged upon another; properly, an accomplice in the crime who impeaches others.

PROBATUM EST, *it is proved*, a term frequently subjoined to a receipt for the cure of some disease.

PROBE, a surgeon's instrument for examining the circumstances of wounds, ulcers, and other cavities, searching for stones in the bladder, &c. See the article LITHOTOMY, &c.

PROBLEM, πρόβλημα, in logic, a proposition that neither appears absolutely true or false; and, consequently, may be asserted either in the affirmative or negative.

A logical or dialectical problem, according to the schoolmen, consists of two parts; a subject, about which the doubt is raised; and a prædicate, or attribute, which is the thing doubted whether it be true of the subject or not.

Problems may be divided into physical, ethical, and metaphysical; physical, when it is doubted whether such and such properties belong to certain natural bodies; ethical, when the doubt is, whether or not it be proper to do or omit certain actions; and metaphysical, when the doubt relates to spirits, &c.

PROBLEM, in geometry, is a proposition, wherein some operation or construction is required; as to divide a line or angle, erect or let fall perpendiculars, &c.

According to Wolfius, a problem consists of three parts; the proposition, which expresses what is to be done; the solution, wherein the several steps whereby the thing required is to be effected, are rehearsed in order; and, lastly, the demonstration, wherein is shewn, that by doing the several things prescribed in the solution, the thing required is obtained.

PROBLEM, in algebra, is a question or proposition which requires some unknown truth to be investigated, and the truth of the discovery demonstrated. So that a problem is to find a theorem. See the article THEOREM.

Kepler's PROBLEM, in astronomy, is the determining a planet's place from the time; so called from Kepler, who first proposed it. It was this, to find the position of a right line, which, passing through one of the foci of an ellipsis, shall cut off an area described by its motion, which shall be in any given proportion to the whole area of the ellipsis. See the article ANOMALY.

The proposer knew no way of solving the problem but by an indirect method; but Sir Isaac Newton, Dr. Keill, &c. have since solved it directly and geometrically, several ways.

Deliacal PROBLEM, or a problem for finding two mean proportionals between two given lines, in geometry, is the doubling of the cube; it was so called from the people of Delos, who, upon consulting the oracle for a remedy against a plague, were answered, that the plague should cease when Apollo's altar, which was in form of a cube, should be doubled. See the article DUPLICATION.

Local PROBLEM. See the article LOCAL.

PROBLEMATICAL RESOLUTION, in algebra, a method of solving difficult questions by certain rules, called canons.

PROBOSCIS, in natural history, is the trunk or snout of an elephant, and some other animals and insects. See the article ELEPHANT.

Flies, gnats, &c. are furnished with a proboscis, or trunk; by means of which they suck the blood of animals, the juice of vegetables, &c. for their food. See the articles FLY, GNAT, BEE, &c.

PROCATARCTIC CAUSE, in medicine, the pre-existing, or pre-disposing cause or occasion of a disease. See the article DISEASE.

PROCEDENDO, in law, a writ whereby a plea or cause, formerly called from an inferior court to the court of Chancery, King's bench, or court of Common-pleas, by writ of privilege, habeas corpus, or certiorari, is released, and returned to the other court to be proceeded in,

in, upon its appearing that the defendant has no caufe of privilege, or that the matter in the party's allegation is not well proved.

PROCEDURE, or PROCEEDINGS, in law, the courfe of the feveral acts, inftructions, &c. of a procefs or law-fuit.

It is either civil or criminal: civil procedure relates to the eftate alone; criminal or extraordinary procedure, where the perfon is profecuted.

PROCEED, among merchants, whatever arifes from any thing.

PROCELEUSMATICUS, in the antient poetry, a foot confifting of four fhort fyllable, or two pyrrhichiufes, as *hominibus*. See FOOT and PYRRHICHIUS.

PROCELLARIA, the STORM-BIRD, in ornithology, a genus of birds, belonging to the order of the pafferes, the characters of which are thefe: the beak is of a compreffed figure, the upper and under chops are of an equal length, and the upper one is hooked at the point; the noftrils are of a cylindric form, run parallel, and grow to the beak; and the feet are palmated.

It is about the fize of the common water-wagtail, and its general colour is black, very gloffy on the head and back, only the covering feathers of the wings have fome white toward their tips. Before a ftorm it always gets under the covert of fhips failing in the northern feas, which is a fure token of an approaching ftorm; whence the name.

PROCESS, in law, denotes the proceedings in any caufe, real or perfonal, civil or criminal, from the original writ to the end thereof.

In a more limited fenfe, procefs denotes that by which a man is firft called into any temporal court.

The difference between procefs and precept, or warrant, is, that the latter is only to attach or convene the party, before any indictment or conviction, and may be either in the king's or juftice's name: but procefs is always in the king's name, and commonly after an indictment.

PROCESS, in chemiftry, the whole courfe of an experiment or feries of operations, tending to produce fomething new.

PROCESS, *proceffus*, in anatomy, denotes any protuberance or eminence in a bone.

PROCESSION, *proceffio*, in theology, denotes the manner in which the Holy Ghoft is conceived to iffue from the Father and Son, in the myftery of the Trinity. See the article TRINITY.

PROCESSION alfo denotes a ceremony in the romifh church, confifting of a formal march of the clergy and people, putting up prayers, &c. and in this manner vifiting fome church, &c. They have alfo proceffions of the hoft or facrament, &c. See the article HOST, &c.

PROCESSUM CONTINUANDO, a writ for continuing a procefs after the death of the chief juftice, or other juftices of oyer and terminer.

PROCHEIN AMY, *proximus amicus*, in law, the perfon next a kin to a child in non-age, and who, in that refpect, is allowed to act for him, and be his guardian, &c. if he hold land in foccage.

To fue, an infant is not allowed to make an attorney; but the court will admit his next friend as plaintiff; or his guardian as defendant.

PROCIDENTIA ANI, UTERI, &c. the fame with prolapfus. See the article PROLAPSUS.

PROCLAMATION, a public notice given of any thing of which the king thinks proper to advertife his fubjects.

Proclamations are a branch of the king's prerogative, and no perfon can make them without the king's authority, except mayors of towns, &c. by cuftom of privilege. Proclamations which require the people to do, or not to do, certain things, have the force of laws; but then they are fuppofed to be confiftent with the laws already in being, otherwife they are fuperfeded.

Proclamation is ufed for a folemn declaration of war and peace, and for the act of notifying the acceffion of a prince to the throne; and alfo for the public declaration ufed at the calling of a court, and likewife on the difcharge or adjourning; both for the attendance of perfons, and difpatch of bufinefs there.

In courts baron, proclamation is made for any perfon to come in and claim copyholds that are vacant, and of which any tenant died feifed fince the laft court; after which the lord may feize the copyhold, if the heir does not come in to be admitted: and before a parliament is diffolved, proclamation is made, that if any perfon has any petition he may come in and be heard.

Proclamation of rebellion, is a writ by which a perfon who does not appear upon a fubpœna, or an attachment of contempt in the court of Chancery, is reputed and declared a rebel, if he does not furrender

furrender himfelf by a day affigned. For proclamation of a fine, and proclamation of exigents, fee the articles FINE and EXIGENTS.

PROCONDYLUS, a name given to the firft joint of each finger. See the article CONDYLUS.

PRO-CONFESSO, in law, is where a bill is exhibited in chancery, and the defendant appears, and is in contempt for not anfwering: in this cafe the whole matter contained in the bill fhall be taken as if it were confeffed by the defendant.

PROCONSUL, a roman magiftrate, fent to govern a province with confular authority.

The proconfuls were appointed out of the body of the fenate, and ufually as the year of any one's confulate expired, he was fent proconful into fome province. The proconfuls decided cafes of equity and juftice, either privately in their prætorium or palace, where they received petitioners, heard complaints, granted writs under their feal, and the like; or elfe publicly, in the common hall, with the ufual formalities obferved in the court of judicature at Rome. They had befides, by virtue of their edicts, the power of ordering all things relating to the tribunes, taxes, contributions, and provifions of corn and money, &c. Their office lafted only a year. See CONSUL.

PROCONSUL, in our antient law books, is the fame with juftice in eyre. See the article JUSTICE.

PROCREATION, the begetting and bringing forth children. See the article GENERATION.

PROCTOR, a perfon commiffioned to manage another perfon's caufe in any court of the civil or ecclefiaftical law.

The proctors of the clergy, are the reprefentatives chofen by the clergy to fit in the lower houfe of convocation: of thefe there are two for each diocefe, and one for each collegiate church.

PROCTORS, in an univerfity, are two officers chofen from among the ftudents to fee good order and exercifes daily performed.

PROCURATION, or PROCURACY, an act or inftrument by which a perfon is impowered to treat, tranfact, receive, &c. in another perfon's name. This word is is now little ufed in this fenfe, except in the cafe of a perfon who collects the fruits of a benefice for another.

The fame word is ufed for certain fums of money annually paid by parifh-priefts to the bifhop or archdeacon, on account of vifitation, and which, in former times, were paid in neceffary victuals and provifions for the vifitor and his attendants.

PROCURATOR, a perfon who has a charge committed to him, to act for another.

Thus the proxies of the lords in parliament are, in our law books, called procurators: the bifhops are fometimes called *procuratores ecclefiarum*; and the reprefentatives fent by the clergy to convocation, *procuratores clerici*. The word is alfo ufed for a vicar or lieutenant; and we read of a procurator regni, who was an antient magiftrate. Thofe who manage caufes in Doctor's commons are alfo called procurators or proctors. In our ftatutes, he who gathers the fruits of a benefice for another is particularly called a procurator, and the inftrument impowering him to receive them is termed a procuracy.

PROCURATOR, is alfo a kind of magiftrate in feveral cities in Italy, as the procurators of St. Mark at Venice, Genoa, &c. The procurators of St. Mark are the adminiftrators of that church, and of the revenues attached to it: they are the patrons of orphans, and the executors of teftaments, and are cloathed in black velvet with ducal fleeves.

PROCYON, in aftronomy, a fixed ftar of the fecond magnitude in the conftellation, called canis minor. See CANIS.

PRODICTATOR, in roman antiquity, a magiftrate who had the power, and did the office, of a dictator. See the article DICTATOR.

They fometimes created this magiftrate where they could not have a dictator.

PRODUCING, in geometry, fignifies the drawing out a line farther till it have any affigned length.

PRODUCT, in arithmetic and geometry, the factum of two or more numbers, or lines, &c. into one another: thus $5 \times 4 = 20$, the product required.

In lines it is always (and in numbers fometimes) called the rectangle between the two lines, or numbers, multiplied by one another.

PRODUCTION, in anatomy, the fame with procefs. See PROCESS.

PROEM, a term fometimes ufed for prelude or preface. See the articles PRELUDE and PREFACE.

PRO-

PROEMPTOSIS, in aſtronomy, the appearance of the new moon a day later, by reaſon of the lunar equation. See the article MOON.

PROFANATION, the acting diſreſpectfully to ſacred things.

PROFANE, a term uſed in oppoſition to holy, and, in general, is applied to all perſons who have not the ſacred character, and to things which do not belong to the ſervice of religion.

PROFER, in law, the time appointed for the accounts of ſheriffs, and other officers, to be given in to the Exchequer, which ſhould be twice a year, by ſtat. 51 Hen. III.

It alſo denotes an offer, or endeavour, to proceed in an action by a perſon concerned ſo to do.

PROFESSION, *profeſſio*, among the Romaniſts, denotes the entering into a religious order, whereby a perſon offers himſelf to God, by a vow of inviolably obſerving obedience, chaſtity, and poverty.

PROFESSOR, in the univerſities, a perſon who teaches or reads public lectures in ſome art or ſcience from a chair for the purpoſe.

In the foreign and ſcottiſh univerſities, profeſſors teach the arts, and have their claſſes of pupils; but thoſe in England only read public lectures in term-time.

Some profeſſors are denominated from the arts they profeſs, others from the founders of the profeſſorſhips, or thoſe who aſſigned a revenue for the ſupport of the profeſſors. Such are the ſavilian profeſſors, at Oxford; the lucaſian, at Cambridge; and the regius profeſſors for reading lectures in each of our univerſities, on divinity, hebrew, greek, law, and phyſic: ſo called from theſe lectures being founded by king Henry VIII.

PROFILE, in architecture, the draught of a building, fortification, &c. wherein are expreſſed the ſeveral heights, widths, and thickneſſes, ſuch as they would appear, were the building cut down perpendicularly from the roof to the foundation. It is alſo called ſection, orthographical ſection, and, by Vitruvius, ſciagraphy. This is the ſame as elevation, in oppoſition to a plan, ichnography. See the article FORTIFICATION.

PROFILE alſo denotes the outline of a figure, building, member of architecture, &c. Hence profiling ſometimes denotes deſigning or deſcribing the member with a rule, compaſs, &c.

PROFILE, in ſculpture and painting, denotes a head, portrait, &c. when repreſented ſide-ways, or in a ſide view. On almoſt all medals, faces are repreſented in profile.

PROFLUVIUM, in medicine, denotes a flux, or liquid evacuation, of any thing. See the article FLUX.

PROGNOSTICS, προγνωστις, among phyſicians, ſignifies a judgment concerning the event of a diſeaſe, as whether it ſhall end in life or death, be ſhort or long, mild or malignant, &c. See the articles DISEASE, SIGN, and INDICATION.

A prudent phyſician will be very cautious in delivering his prognoſtic, and not, like bold quacks, promiſe all will go well, whether the caſe is curable or not. He ought to avoid both extremes, and to declare from his conſcience what he takes to be the true ſtate of the patient; only in dangerous caſes he ſhould do it to the relations, and at the ſame time tell his reaſons both for hope and fear; for as to the patient himſelf, it is proper to cheriſh him with hopes of a recovery, both becauſe ſome diſorders are much aggravated by fear, and the expectation of future health and eaſe has often a happy effect.

PROGRAMMA, antiently ſignified a letter, ſealed with the king's ſeal.

Programma is alſo an univerſity-term for a billet or advertiſement, poſted up, or given into the hand, by way of invitation to an oration, &c. containing the argument, or ſo much as is neceſſary for underſtanding thereof.

PROGRESSION, in general, denotes a regular advancing, or going forward, in the ſame courſe and manner.

PROGRESSION, in mathematics, is either arithmetical or geometrical. Continued arithmetic proportion, where the terms do increaſe and decreaſe by equal differences, is called arithmetic progreſſion; thus $\left\{\begin{matrix} a, a+d, a+2d, a+3d, \&c. \text{ increaſing} \\ a, a-d, a-2d, a-3d, \&c. \text{ decreaſing} \end{matrix}\right\}$ by the difference d.

In numbers $\left\{\begin{matrix} 2, & 4, & 6, & 8, & 10, & \&c. \text{ increaſing} \\ 10, & 8, & 6, & 4, & 2, & \&c. \text{ decreaſing} \end{matrix}\right\}$ by the difference 2.

But ſince this progreſſion is only a compound of two ſeries, *viz.*

of $\left\{\begin{matrix} \text{Equals} & a, & a, & a, & a, & a, \\ \text{Arith. proportionals } 0, & \pm d, & \pm 2d, & \pm 3d, & \pm 4d, \end{matrix}\right\}$ &c.

 There-

Therefore the moſt natural arithmetic progreſſion is that which begins with o: as

$$o, \pm d, \pm 2d, \pm 3d, \pm 4d, \begin{cases}\text{increaſing.}\\ \text{decreaſing.}\end{cases}$$

In any arithmetical progreſſion,

If $\left\{\begin{matrix} a \\ d \\ n \\ l \\ s \end{matrix}\right\}$ be the $\left\{\begin{matrix}\text{firſt term} \\ \text{common difference,} \\ \text{number of terms,} \\ \text{laſt term,} \\ \text{ſum of all the terms;}\end{matrix}\right\}$ then any three of theſe terms being given, the other two are eaſily found.

And the ſeveral caſes are reducible into ten propoſitions, which are all ſolved by the two following lemmata.

Lemma I. In any arithmetic progreſſion, it is, $1 : \frac{n}{2} :: a+l : s$

$$\text{For}\left\{\begin{matrix} a \\ a+d \\ a+2d \\ a+3d \\ \&c. \end{matrix}\right\} + \left\{\begin{matrix} l \\ l-d \\ l-2d \\ l-3d \\ \&c. \end{matrix}\right\} = \left\{\begin{matrix} a+l \\ a+l \\ a+l \\ a+l \\ \&c. \end{matrix}\right\}$$

Therefore $s+s = \overline{a+l}\times n$. That is, $2s = \overline{a+l}\times n$. Conſequently, $1 : \frac{n}{2} :: a+l : s$.

From this the following corollaries naturally follow.

Cor. I. $a = \frac{2s}{n} - l = \frac{2s-nl}{n} = \overline{2s-nl}\times\frac{1}{n}$

Cor. II. $n = \frac{2s}{a+l} = 2\times\frac{s}{a+l} = 2s\times\frac{1}{a+l}$.

Cor. III. $l = \frac{2s}{n} - a = \frac{2s-na}{n} = \overline{2s-na}\times\frac{1}{n}$.

Cor. IV. $s = \frac{n}{2}\times\overline{a+l} = \frac{n\times\overline{a+l}}{2} = \frac{na+nl}{2} = n\times\frac{a+l}{2}$.

Lemma II. In any arithmetic progreſſion it is $1 : n-1 :: d : l-a$.

For, $a, a+d, a+2d, a+3d, a+\overline{n-1}\times d = l$. That is, $\overline{n-1}\times d = l-a$, by tranſpoſition. Therefore, $1 : n-1 :: d : l-a$.

From this likewiſe the four following corollaries are deduced.

Cor. I. $a = l - \overline{n-1}\times d = l-nd+d$.

Cor. II. $n = \frac{l-a}{d} + 1 = \frac{l-a+d}{d}$.

Cor. III. $d = \frac{l-a}{n-1} = l-a\times\frac{1}{n-1}$.

Cor. IV. $l = a+\overline{n-1}\times d = a+nd-d$.

Prop. I. Given $a=2=$ the firſt term, $d=2=$ the common difference, $n=15=$ the number of terms; required $l=$ the laſt term, and $s=$ the ſum of all the terms.

Solution. 1. $l = a+nd-d = \frac{2s-na}{n} = 30$ by Lem. I. and II.

Then, $na+nnd-nd = 2s-na$; and $2s = 2na+nnd-nd$, by tranſpoſition.

2. Therefore, $s = na+\frac{nnd-nd}{2}$ by diviſion $= 240$.

Prop. II. Given a, d, l; required n, s.

Solution. 1. $n = \frac{l-a+d}{d} = \frac{2s}{a+l}$ by Lem. I. and II.

Then, $2ds = ll+ld-a^2+ad$, by multiplication.

2. Therefore, $s = \frac{ll+ld-a^2+ad}{2d}$ by diviſion.

Prop. III. Given a, d, s; required n, l.

Solution. Since $l = \frac{2s-na}{n} = a+nd-d$ by Lem. I. and II.

Therefore, $nnd+2na-nd = 2s$, by multiplication and tranſpoſition.

And $nn+\frac{2a-d}{d}n = \frac{2s}{d}$ by diviſion.

1. Then, $n = \frac{\sqrt{aa+\frac{1}{4}dd-ad+2ds}-a}{d}+\frac{1}{2}$.

And becauſe $n = \frac{2s}{a+l} = \frac{l-a+d}{d}$ by Lem. I. and II.

Therefore, $ll+dl = 2ds-ad+aa$, by multiplication and tranſpoſition.

2. Then $l = \sqrt{2ds-ad+aa+\frac{1}{4}dd} - \frac{1}{2}d$, by compleating the ſquare and evolution.

Prop. IV. Given a, l, s; required n, d.

Solution. 1. $n = \frac{2s}{l+a} = \frac{l-a+d}{d}$ by Lem. I. and II.

Then, $2ds-ld-ad = ll-aa$, by multiplication and tranſpoſition.

2. Therefore, $d = \frac{ll-aa}{2s-l-a}$ by diviſion.

Prop. V. Given a, n, s; required l, d.

Solution. 1. $l = \frac{2s-na}{n} = a+nd-d$ by Lem. I. and II.

Then $nnd-nd = 2s-2na$ by multiplication and tranſpoſition.

2. Therefore, $d = \frac{2s-2na}{nn-n}$, by diviſion.

Prop. VI. Given a, n, l; required d, s.

Solution. 1. $d = \frac{l-a}{n-1} = l-a\times\frac{1}{n-1}$, by Lem. II.

2. $s=\frac{na+nl}{2}=\overline{a+l}\times\frac{n}{2}$, by Lem. I.

Prop. VII. Given d, l, n; required a, s.

Solution. 1. $a=l-nd+d=\frac{2s-nl}{n}$ by Lem. II. and I.

Then, $2s=2nl-nnd+nd$, by multiplication and transposition.

2. Therefore, $s=\frac{2nl-nnd+nd}{2}$, by division.

Prop. VIII. Given d, n, s; required a, l.

Solution. Since $l=a+nd-d=\frac{2s-na}{n}$ by Lem. II. and I.

Then, $2na=2s-nnd+nd$, by multiplication and transposition.

1. Therefore, $a=\frac{2s-nnd+nd}{2n}$, by division.

And, since $a=l-nd+d=\frac{2s-nl}{n}$, by Lem. II. and I.

Then, $2nl=2s+nnd-nd$, by multiplication and transposition.

2. Therefore, $l=\frac{2s+nnd-nd}{2n}$, by division.

Prop. IX. Given d, l, s; required a, n.

Solution. Since $n=\frac{2s}{a+l}=\frac{l-a+d}{d}$, by Lem. I. and II.

Then $aa-ad=ll+ld-2ds$, by multiplication and transposition.

1. Therefore, $a=\pm\sqrt{ll+ld-2ds+\frac{1}{4}dd}+\frac{1}{2}d$.

And because $a=l-nd+d=\frac{2s-nl}{n}$, by Lem. II. and I.

Therefore $-nnd+2nl+nd=2s$, by multiplication and transposition.

And $-nn+\frac{2l+d}{d}n=\frac{2s}{d}$, by division.

2. Then, $n=\frac{1}{2}+\frac{l\pm\sqrt{ll+\frac{1}{4}dd+ld-2ds}}{d}$

Prop. X. Given n, l, s; required a, d.

Solution. 1. $a=\frac{2s-nl}{n}=l-nd+d$, by Lem. I. and II.

Then, $2nl-2s=nnd-nd$, by multiplication and transposition.

2. Therefore, $d=\frac{2nl-2s}{nn-n}$, by division.

To find the sum of the powers of any arithmetic PROGRESSION.

Preparation. Suppose n the index of the power.

Let each term of the progression be raised to each power, under that whose sum is sought. And let the sum of each rank so raised, be multiplied by the multiple of the like dimension of a in $\overline{a+d}|^{n+1}$.

Put z for the sum of all the products.

And m for the multiple of a^n, in the power $\overline{a+d}|^{n+1}$

Solution.

Then $\frac{\overline{l+d}|^{n+1}-a^{n+1}+nd^{n+1}+z}{m}$

is the sum of any series of powers, whose roots are arithmetically proportional. For suppose the sum of the cubes of this arithmetic progression a, $a+d$, $a+2d$, $a+3d$, was required.

1. $\overline{a+d}|^{n+1}=\overline{a+d}|^4=a^4+4a^3d+6a^2d^2+4ad^3+d^4$, and the sum of this series is $4a+6d$. Which multiply by $4d^3$ (the multiple of a into $\overline{a+d}|^{3+1}$) the product will be $16ad^3+24d^4$. Also the sum of their squares is $4a^2+12ad+14d^2$. Which multiply by $6d^2$ (the multiple of a^2 in $\overline{a+d}|^{3+1}$) the product will be $24a^2d^2+72ad^3+84d^4$.

Therefore $z=24a^2d^2+88ad^3+108d^4=$ sum of these products

To which add $a^4 \quad + 4d^4 \quad (=a^{3+1}+nd^{3+1})$

The sum is $a^4+24a^2d^2+88ad^3+112d^4 \; (=a^{n+1}+nd^{n+1}+z)$

From $\overline{l+d}|^{n+1}=\overline{a+4d}|^4=a^4+16a^3d+96a^2d^2+256ad^3+256d^4$

Subtract $a^{n+1}+nd^{n+1}+z= a^4 \; * \; +24a^2d^2+88ad^3+112d^4$

Then $\overline{l+d}|^{n+1}-a^{n+1}+nd^{n+1}+z=16a^3d+72a^2d^2+168ad^3+144d^4$.

And $\frac{16a^3d+72a^2d^2+168ad^3+144d^4}{(m=)\,4d}=4a^3+18a^2d+42ad^2+56d^3$; the sum of the cubes the given cubes of the given terms. Because

$$\text{The cube of}\begin{cases}a\\a+d\\a+2d\\a+3d\end{cases}\text{is}\begin{cases}a^3\\a^3+3a^2d+3ad^2+d^3\\a^3+6a^2d+12ad^2+8d^3\\a^3+9a^2d+27ad^2+27d^3\end{cases}$$

The sum is $4a^3+18a^2d+42ad^2+36d^3$

The

The same with the quotient before found. It is the same in any other series for any other power.

Geometric PROGRESSION, or continued geometric proportion, is when the terms do increase or decrease by equal ratios: thus,

$a,\ ar,\ arr,\ arrr,$ &c. increasing, $a,\ \frac{a}{r},\ \frac{a}{rr},\ \frac{a}{rrr},$ &c. decreasing, from a continual multiplication / division by r.

2, 4, 8, 16, 32, 64, increasing; 64, 32, 16, 8, 4, 2, decreasing, from a continual multiplication / division by 2.

But since this progression is only a compound of two series, *viz.*

of Equals $a,\ a,\ a,\ a,\ a,\ a,$ &c.
Geometric proportion, $1,\ r,\ r^2,\ r^3,\ r^4,\ r^5,$ &c.

therefore the most natural progression is that which begins with unity,

as $\frac{1}{1},\ \frac{r}{1},\ \frac{r^2}{1},\ \frac{r^3}{1},\ \frac{r^4}{1},\ \frac{r^5}{1},$ &c. increasing.
that is, $1.\ r,\ r^2,\ r^3,\ r^4,\ r^5$

as $\frac{1}{1},\ \frac{1}{r},\ \frac{1}{r^2},\ \frac{1}{r^3},\ \frac{1}{r^4},\ \frac{1}{r^5},$ &c. decreasing.
that is, $1,\ r^{-1},\ r^{-2},\ r^{-3},\ r^{-4},\ r^{-5}$

In geometric progression,

If a, r, n, l, s be the first term, the ratio, number of terms, last term, sum of all the terms; then any three of these terms being given, the other two are easily found.

And the several cases are reducible to ten propositions, which are solved by the two following lemmata.

Of increasing progressions.

Lem. I. In an increasing geometric progression $a,\ ar,\ ar^2,\ ar^3,\ ar^4,\ ar^5,$ &c. it is $1 : r :: s-l : s-a$.

For $a : ar :: s-l : s-a$.
But $a : ar :: 1 : r$
Therefore $1 : r :: s-l : s-a$.

Cor. 1. $s = \frac{rl-a}{r-1} = \frac{l-a}{r-1} + l$.

Cor. 2. $r = \frac{s-a}{s-l} = \overline{s-a} \times \frac{1}{s-l}$.

Cor. 3. $a = s + rl - rs = rl - s \times \overline{r-1}$.

Cor. 4. $l = \frac{rs-s+a}{r} = \frac{a+\overline{r-1}\times s}{r} = s - \frac{s-a}{r}$.

Lem. II. In an increasing geometric progression it is $1 : r^{n-1} :: a : l$.

For $a,\ ar,\ ar^2,\ ar^3,\ ar^4,$ &c. $ar^{n-1} = l$.

Therefore $1 : r^{n-1} :: a : l$.

Cor. 1. $l = ar^{n-1} = a \times r^{n-1}$.

Cor. 2. $a = \frac{l}{r^{n-1}} = l \times \frac{l}{r^{n-1}}$.

Cor. 3. $n = \frac{L.r^{n-1}}{L.r} + 1 = \frac{L.l - L.a}{L.r} + 1$;

that is, the logarithm of l — the logarithm of a, divided by the logarithm of r.

Cor. 4. $r = \overline{l \div a}^{\frac{1}{n-1}}$.

Prop. I. Given $a,\ r,\ n$, required $l,\ s$.

1. $l = ar^{n-1} = a \times r^{n-1}$, by Lem. II.

But $s = \frac{rl-a}{r-1}$, by Lem. I. and $r \times l = ar^n$, by multiplication.

2. Therefore $s = \frac{ar^n - a}{r-1} \left(= a \times \frac{r^{n-1}}{r-1}\right)$ by substitution.

Prop. II. Given $a,\ r,\ l$; required $s,\ n$.

1. $s = \frac{rl-a}{r-1} = \frac{l-a}{r-1} + l$, by Lem. I.

2. $n = \frac{L.l. - L.a}{L.r} + 1$. by Lem. II.

Prop. III. Given $a,\ r,\ s$; required $l,\ n$.

1. $l = \frac{\overline{r-1}\times s + a}{r} = ar^{n-1}$, by Lem. I. and II.

Then $\overline{r-1}\times s + a = r \times ar^{n-1} = ar^n$, by multiplication.

And $r^n = \frac{\overline{r-1}\times s + a}{a}$, by division. But

$nL.r = L.\frac{\overline{r-1}\times s + a}{a}$.

2. Therefore $n = \frac{L.\overline{r-1}\times s + a - L.a}{L.r}$ by division.

Prop.

Prop. IV. Given a, l, s; required r, n.

1. $r = \frac{s-a}{s-l} = \overline{s-a} \times \frac{1}{\overline{s-l}}$, by Lem. I.

2. $n = \frac{L.l - L.a}{L.r} + 1 = \frac{L.l - L.a}{L.\overline{s-a} - L.\overline{s-l}} + 1$. by Lem. II.

Prop. V. Given a, n, s; required r, l.

Since $\frac{sr-s+a}{r} = l = ar^{n-1}$, by Lem. I. and II.

Then $sr - ar^n = s - a$, by division and transposition.

1. Therefore, $-r^n + \frac{s}{a}r = \frac{s-a}{a} = \frac{s}{a} - 1$, by division.

And since $l = ar^{n-1}$, and $r = \frac{s-a}{s-l}$;

therefore $l = a \times \overline{\frac{s-a}{s-l}}|^{n-1}$.

2. Theref. $l \times \overline{s-l}|^{n-1} = a \times \overline{s-a}|^{n-1}$ by multiplication.

Prop. VI. Given a, n, l; required r, s.

1. $r = \overline{l \div a}|^{\frac{1}{n-1}}$, by Lem. II. But $\frac{l-a}{r-1} + l = s$, by Lem. I.

2. Therefore $s = \frac{l-a}{\overline{l \div a}|^{\frac{1}{n-1}} - 1} + l$, by substitution.

Prop. VII. Given r, n, l; required a, s.

1. $a = \frac{l}{r^{n-1}}$, by Lem. II. But $\frac{lr-a}{r-1} = s$, by Lem. I.

2. Therefore $s = \frac{lr - \frac{l}{r^{n-1}}}{r-1} = \frac{lr^n - l}{r^n - r^{n-1}}$ by substitution.

Prop. VIII. Given r, s, n; required a, l.

Since $sr - s + a = ar^n$, by Lemma I. and II.

Then $sr - s = ar^n - a \left(= a \times \overline{r^n - 1}\right)$ by transposition.

1. Therefore $a = \frac{sr-s}{r^n-1} = \frac{r-1}{r^n-1} \times s$, by division.

And since $s = \frac{lr^n - l}{r^n - r^{n-1}}$, by Prop. VII.

Therefore $sr^n - sr^{n-1} = lr^n - l$.

2. Therefore $l = \frac{sr^n - sr^{n-1}}{r^n - 1}$, by division.

Prop. IX. Given r, l, s; required a, n.

1. $a = s + rl - rs = lr - s \times \overline{r-1}$, by Lem. I.

But $\frac{l}{a} = \left(\frac{l}{s+rl-rs}\right) = r^{n-1}$ by Lemma II.

And $L.\frac{l}{s+rl-rs} = \overline{n-1}\, L.r$, by the nature of logarithms.

2. Therefore $n = \frac{L.l - L.\overline{s+rl-rs}}{L.r} + 1$, by division and transposition.

Prop. X. Given n, l, s; required r, a.

Since $sr^n - sr^{n-1} = lr^n - l$, by Proposition VIII.

Then $l = sr^{n-1} - sr^n + lr^n \left(= sr^{n-1} - \overline{s-l} \times r^n\right)$ by transposition.

1. Therefore $-r^n + \frac{s}{s-l}r^{n-1} \left(= \frac{s}{s-l}r^{n-1} - r^n\right) = \frac{l}{s-l}$.

2. $a \times \overline{s-a}|^{n-1} = l \times \overline{s-l}|^{n-1}$, by Proposition V.

Of decreasing geometric progressions.

In finite decreasing progressions, the same rules will serve for the like propositions, if the series be inverted, so that the least term be the first, and the greatest the last. And since in the increasing progression it is $r-1 : 1 :: l-a : s-l$; therefore in a decreasing geometric proportion it is $r-1 : 1 :: a-l : s-a$, by inverting the terms.

Cor. I. But in an infinite decreasing progression $l = 0$; therefore $r - 1 : 1 :: a : s-a$. Whence,

Prop.	Given.	Required.	Solution.
1.	a	s	$ra \div r-1$
2.	s, a	r	$s \div s-a$
3.	s, r	a	$s - s \div r$

Cor. II. Also $a - \frac{a}{r} : \frac{a}{r}$ (that is, 1st — 2d : 2d, or x) $:: r-1 : 1$,

Therefore $a - x : x \left\{\begin{matrix} a-l \\ a \end{matrix}\right\} : s-a$ in $\left\{\begin{matrix} \text{a finite} \\ \text{an infinite} \end{matrix}\right\}$ progression.

And $s = \frac{aa - xl}{a-x}$ in a finite, or $s = \frac{aa}{a-x}$ in an infinite decreasing progression.

Question. Suppose a body should move at this rate, *viz.* in the first moment 10 miles, in the second 9 miles, in the third $8\frac{1}{10}$, &c. eternally, as 10 to 9.

Here is given $r = \frac{10}{9}$, $a = 10$; required s. Then, by

Cor.

Cor. $\left\{\begin{matrix} \text{I.} \\ \text{II.} \end{matrix}\right\} s = \left\{\begin{matrix} ra \div \overline{r-1} \\ aa \div \overline{a-x} \end{matrix}\right\} =$ 100 miles fought.

That is, a moveable body continuing its motion in that ratio eternally, would only run 100 miles, or more than any thing that is lefs than 100 miles.

Cor. III. Since $r-1:1::a:s-a$; therefore $s-a=\frac{a}{r-1}=a+\frac{a}{r}+\frac{a}{r^2}+\frac{a}{r^3}$, &c.

$-a=\frac{a}{r}+\frac{a}{r^2}+\frac{a}{r^3}$, &c.

Whence if any quantity a, be continually divided by any other quantity r, the fum of all the terms will be $\frac{a}{r-1}$, that is, $\frac{1}{r-1}\times a$; or the $\frac{1}{r-1}$ of a. Therefore $a\times\frac{1}{r}+\frac{1}{r^2}+\frac{1}{r^3}+\frac{1}{r^4}$, &c. $=a\times\frac{1}{r-1}$. Or, $\frac{1}{r}+\frac{1}{r^2}+\frac{1}{r^3}+\frac{1}{r^4}$, &c. $=\frac{1}{r-1}$. Where, if $a=r-1$, then $s=1$.

Whence, it is evident, that an infinite progreffion, or an infinitely infinite one, may be collected into one fum; which fum may not be only finite, but equal to nothing. And of infinites it is hence plain, that fome are equal, others unequal: and alfo, that one infinite may be equal to two or more finites, or infinites.

PROHIBITED GOODS, in commerce, the fame with contraband goods. See the article CONTRABAND.

PROHIBITIO DE VASTO DIRECTA PARTE, in law, is a writ judicial directed to a tenant, prohibiting him from making wafte upon the land in controverfy during the fuit.

This writ is alfo fometimes directed to the fheriff.

PROHIBITION, in law, is a writ that iffues out of the chancery, king's bench, or common pleas, to prohibit fome other court, either fpiritual or fecular, to proceed in a caufe there depending, upon a fuggeftion that the caufe does not belong to the court.

PROJECTILES, are fuch bodies as being put in a violent motion by any great force, are then caft off or let go from the place where they received their quantity of motion: as a ftone thrown from a fling, an arrow from a bow, a bullet from a gun, &c.

It is ufually taken for granted, by thofe who treat of the motion of projectiles, that the force of gravity near the earth's furface is every where the fame, and acts in parallel directions; and that the effect of the air's refiftance upon very heavy bodies, fuch as bombs and cannon-balls, is too fmall to be taken into confideration.

The famous Sir Ifaac Newton has fhewn, that the gravity of bodies which are above the fuperficies of the earth, is reciprocally as the fquares of their diftances from its center; but the theorems concerning the defcent of heavy bodies, demonftrated by Gallilæus, and Huygens, and others, are built upon this foundation, that the action of gravity is the fame at all diftances: and the confequences of this hypothefis are found to be very nearly agreeable to experience. For it is obvious, that the error arifing from the fuppofition of gravity's acting uniformly, and in parallel lines, muft be exceeding fmall; becaufe even the greateft diftance of a projectile above the furface of the earth, is inconfiderable, in comparifon of its diftance from the center, to which the gravitation tends. But then, on the other hand, it is very certain, that the refiftance of the air to very fwift motions, is much greater than it has been commonly reprefented. Neverthelefs, (in the application of this doctrine to gunnery) if the amplitude of the projection, anfwering to one given elevation, be firft found by experiment (which we fuppofe) the amplitudes in all other cafes, where the elevations and velocities do not very much differ from the firft, may be determined, to a fufficient degree of exactnefs, from the foregoing hypothefis: becaufe, in all fuch cafes, the effects of the refiftance will be nearly as the amplitudes themfelves; and were they accurately fo, the proportions of the amplitudes, at different elevations, would then be the very fame as in vacuo. See RESISTANCE.

Now, in order to form a clear idea of the fubject here propofed, the path of every projectile is to be confidered as depending on two different forces; that is to fay, on the impellant force, whereby the motion is firft begun, (and would be continued in a right line) and on the force of gravity, by which the projectile, during the whole time of its flight, is continually urged downwards, and made to deviate more and more from its firft direction. As whatever relates to the track and flight of a projectile, or ball, (neglecting the refiftance of the air) is to be determined from the action of thefe two forces, it will be proper, before we proceed

proceed to consider their joint effect, to premise something concerning the nature of the motion produced by each, when supposed to act alone, independent of the other; to which end we have premised the two following lemmata.

Lemma I. Every body, after the impressed force whereby it is put in motion ceases to act, continues to move uniformly in a right-line; unless it be interrupted by some other force or impediment.

This is a law of nature, and has its demonstration from experience and matter of fact.

Corollary. It follows from hence, that a ball, after leaving the mouth of the piece, would continue to move along the line of its first direction, and describe spaces therein proportional to the times of their description, were it not for the action of gravity; whereby the direction is changed, and the motion interrupted.

Lemma II. The motion, or velocity, acquired by a ball, in freely descending from rest, by the force of an uniform gravity, is as the time of the descent; and the space fallen through, as the square of that time.

The first part of this lemma is extremely obvious: for since every motion is proportional to the force whereby it is generated, that generated by the force of an uniform gravity, must be as the time of the descent; because the whole effort of such a force is proportional to the time of its action; that is, as the time of the descent.

P, A, c, d, e, f, g, Q, B

To demonstrate that the distances descended are proportional to the squares of the times, let the time of falling thro' any proposed distance A B, be represented by the right line PQ; which conceive to be divided into an indefinite number of very small, equal, particles, represented each, by the symbol m; and let the distance descended in the first of them be Ac; in the second cd; in the third de; and so on.

Then the velocity acquired being always as the time from the beginning of the descent, it will at the middle of the first of the said particles be represented by $\frac{1}{2}m$; at the middle of the second, by $1\frac{1}{2}m$; at the middle of the third, by $2\frac{1}{2}m$, &c. which values constitute the series $\frac{m}{2}, \frac{3m}{2}, \frac{5m}{2}, \frac{7m}{2}, \frac{9m}{2}$, &c.

But since the velocity, at the middle of any one of the said particles of time, is an exact mean between the velocities of the two extremes thereof, the corresponding particle of the distance A B, may be therefore considered as described with that mean velocity: and so, the spaces Ac, cd, de, ef, &c. being respectively equal to the above-mentioned quantities $\frac{m}{2}, \frac{3m}{2}, \frac{5m}{2}, \frac{7m}{2}$, &c. it follows, by the continual addition of these, that the spaces Ac, Ad, Ae, Af, &c. fallen through from the beginning, will be expressed by $\frac{m}{2}, \frac{4m}{2}, \frac{9m}{2}, \frac{16m}{2}, \frac{25m}{2}$, &c. which are evidently to one another in proportion, as, 1, 4, 9, 16, 25, &c. that is, as the squares of the times. *Q. E. D.*

Corollary. Seeing the velocity acquired in any number (n) of the aforesaid equal particles of time (measured by the space that would be described in one single particle) is represented by (n) times m, or nm; it will therefore be, as one particle of time, is to n such particles, so is nm, the said distance answering to the former time, to the distance, n^2m, corresponding to the latter, with the same celerity acquired at the end of the said n particles. Whence it appears that the space $\frac{n^2m}{2}$ (found above) through which the ball falls, in any given time n, is just the half of that (n^2m) which might be uniformly described with the last, or greatest celerity in the same time.

Scholium. It is found by experiment, that any heavy body, near the earth's surface (where the force of gravity may be considered as uniform) descends about 16 feet from rest, in the first second of time. Therefore, as the distances fallen through, are proved above to be in proportion; as the squares of the time. It follows that, as the square of one second, is to the square of any given number of seconds, so is 16 feet to the number of feet, a heavy body will freely descend in the said number of seconds. Whence the number of feet descended in any given time will be found, by multiplying the square of the number of seconds

conds by 16. Thus the diſtance deſcended in 2, 3, 4, 5, *&c.* ſeconds will appear to be 64, 144, 256, 400 feet, *&c.* reſpectively. Moreover, from hence, the time of the deſcent through any given diſtance will be obtained, by dividing the ſaid diſtance in feet, by 16, and extracting the ſquare root of the quotient; or, which comes to the ſame thing, by extracting the ſquare root of the whole diſtance, and then taking $\frac{1}{4}$ of that root for the number of ſeconds required. Thus, if the diſtance be ſuppoſed 2640 feet; then, by either of the two ways, the time of the deſcent will come out 12. 84, or 12. 50 ſeconds.

It appears alſo (from the corol.) that the velocity per ſecond (in feet) at the end of the fall, will be determined by multiplying the number of ſeconds in the fall by 32. Thus it is found that a ball at the end of 10 ſeconds, has acquired a velocity of 320 feet per ſecond. After the ſame manner, by having any two of the four following quantities, *viz.* the force, the times, the velocity, and diſtance, the other two may be determined: for let the ſpace freely deſcended by a ball, in the firſt ſecond of time (which is as the accelerating force) be denoted by F; alſo let T denote the number of ſeconds wherein any diſtance, D, is deſcended; and let V be the velocity per ſecond, at the end of the deſcent; then will

$$V = 2FT = 2\sqrt{FD} = \frac{2D}{T}$$

$$T = \sqrt{\frac{D}{F}} = \frac{V}{2F} = \frac{2D}{V}$$

$$D = FTT = \frac{VV}{4F} = \frac{TV}{2}$$

$$F = \frac{D}{TT} = \frac{V}{2T} = \frac{VV}{4D}$$

All which equations are very eaſily deduced from the two original ones, $D = FTT$, and $V = 2FT$, already demonſtrated; the former in the propoſition itſelf, and the latter in the corollary to it; by which it appears that the meaſure of the velocity at the end of the firſt ſecond is 2 F; whence the velocity (V) at the end of (T) ſeconds muſt conſequently be expreſſed by $2F \times T$ or 2 F T.

Theorem 1. A projected body, whoſe line of direction is parallel to the plane of the horizon, deſcribes by its fall a parabola. If the heavy body is thrown by any extrinſecal force, as that of a gun or the like, from the point A, (plate CCXII. fig. 3. n° 1.) ſo that the direction of its projection is the horizontal line A D; the path of this heavy body will be a ſemi-parabola. For if the air did not reſiſt it, nor was it acted on by its gravity, the projectile would proceed with an equable motion, always in the ſame direction; and the times wherein the parts of ſpace A B, A C, A D, A E, were paſſed over, would be as the ſpaces A B, A C, A D, *&c.* reſpectively. Now if the force of gravity is ſuppoſed to take place, and to act in the ſame tenour, as if the heavy body were not impelled by any extrinſecal force, that body would conſtantly decline from the right line A E; and the ſpaces of deſcent, or the deviations from the horizontal line A E, will be the ſame as if it had fallen perpendicularly. Wherefore if the body falling perpendicularly by the force of its gravity, paſſed over the ſpace A K in the time A B, deſcended thro' A L, in the time A C, and thro' A M in the time A D; the ſpaces A K, A L, A M, will be as the ſquares of the times, that is, as the ſquares of the right lines A B, AC, AD, *&c.* or KF, LG, MH. But ſince the impetus in the direction parallel to the horizon always remains the ſame; (for the force of gravity, that only ſolicites the body downwards, is not in the leaſt contrary to it;) the body will be equally promoted forwards in the direction parallel to the plane of the horizon, as if there was no gravity at all. Wherefore, ſince in the time A B, the body paſſes over a ſpace equal to A B; but being compelled by the force of gravity, it declines from the right line A B thro' a ſpace equal to A K; and B F being equal and parallel to A K, at the end of the time A B, the body will be in F, ſo in the ſame manner, at the end of the time A E, the body will be in I; and the path of the projectile will be in the curve A F G H I; but becauſe the ſquares of the right lines K F, L G, M H, N I, are proportionable to the abſciſſes A K, A L, A M, A N. The curve A F G H I will be a ſemi-parabola. The path therefore of a heavy body projected according to the direction A E, will be a ſemi-parabolical curve Q. E. D.

Theorem 2. The curve line, that is deſcribed by a heavy body projected obliquely and upwards, according to any direction, is a parabola.

Let A F (fig. *ibid.* n° 2.) be the direction of projection, any ways inclined to the

the horizon, gravity being supposed not to act, the moving body would always continue its motion in the same right line, and would describe the spaces A B, A C, A D, &c. proportional to the times. But by the action of gravity it is compelled continually to decline from the path A F, and to move in a curve, which will be a parabola. Let us suppose the heavy body falling perpendicularly in the time A B, through the space A Q, and in the time A C, through the space A R, &c. The spaces A Q, A R, A S, will be as the squares of the times, or as the squares of A B, A C, A D. It is manifest from what was demonstrated in the last theorem, that if in the perpendicular B G, there is taken B M = A Q and the parallelogram be compleated, the place of the heavy body at the end of the time A B, will be M, and so of the rest; and all the deviations B M, &c. from the right line A F, arising from the times, will be equal to the spaces A Q, A R, A S, which are as the squares of the right lines A B, A C, A D. Thro' A draw the horizontal right line A P, meeting the path of the projectile in P. From P raise the perpendicular P E, meeting the line of direction in E; and by reason the triangles A B G, A C H, &c. are equiangular, the squares of the right lines AB, AC, &c. will be proportionable to the squares of A G, A H, &c. so that the deviations B M, C N, &c. will be proportionable to the squares of the right lines A G, A H, &c. Let the line L be a third proportional to E P and A P; and it will be (by 17 El. 6) $L \times EP = APq.$ but $APq. : AGq. :: EP : BM :: L \times EP : L \times BM$; whence since it is $L \times EP = APq.$ it will be $L \times BM = AGq.$ In like manner it will be $L \times CN = AHq.$ &c. But because it is $BG : AG :: (EP : AP ::$ by hypothesis$)$ $AP : L$; it will be $L \times BG = AG \times AP = AG \times AG + AG \times GP = AGq. + AG \times GP$. But it has been shewn that it is $L \times BM = AGq.$ wherefore it will be $L \times BG - L \times BM = AG \times GP$, that is, $L \times MG = AG \times GP$. By the same way of reasoning it will be $L \times NH = AH \times HP$, &c. Wherefore the rectangle under M G and L, will be equal to the square of A G, which is the property of the parabola; and so the curve A M N O P K wherein the projectile is moved will be a parabola.

Cor. 1. Hence the right line L is the latus rectum or parameter of the parabola, that belongs to its axis.

Cor 2. Let A H = H P, and it will be $L \times CN = AHq. = L \times NH$, whence it will be N H = C N; and consequently the right line A F being the line of direction of the projectile, will be a tangent to the parabola.

Cor 3. If a heavy body is projected downwards, in a direction oblique to the horizon; the path of the projectile will be a parabola.

Theorem 3. The impetus of a projected body in different parts of the parabola, are as the portions of the tangents intercepted betwixt two right lines parallel to the axis; that is, the impetus of the body projected in the points A and B, (*ibid.* n° 3.) to which A D, and B E are tangents, will be as C D, and E B, the portions of the tangents intercepted betwixt two right lines C B, and D E parallel to the axis.

We have here treated the path of a projected body as an exact parabola, though from the resistance of the air, the line of a projectile is not exactly parabolical, but rather a kind of hyperbola; which, if considered and applied to practice, would render the computations far more operose, and the very small difference (as experience shews in heavy shot) would, in a great measure, lessen the elegancy of the demonstrations given by accounting for it; since the common rules are sufficiently exact, and easy for practice.

PROJECTION, in mechanics, the act of communicating motion to a body, from thence called projectile. See the preceding article.

In perspective, projection is the appearance or representation of an object on the perspective plane. See PERSPECTIVE.

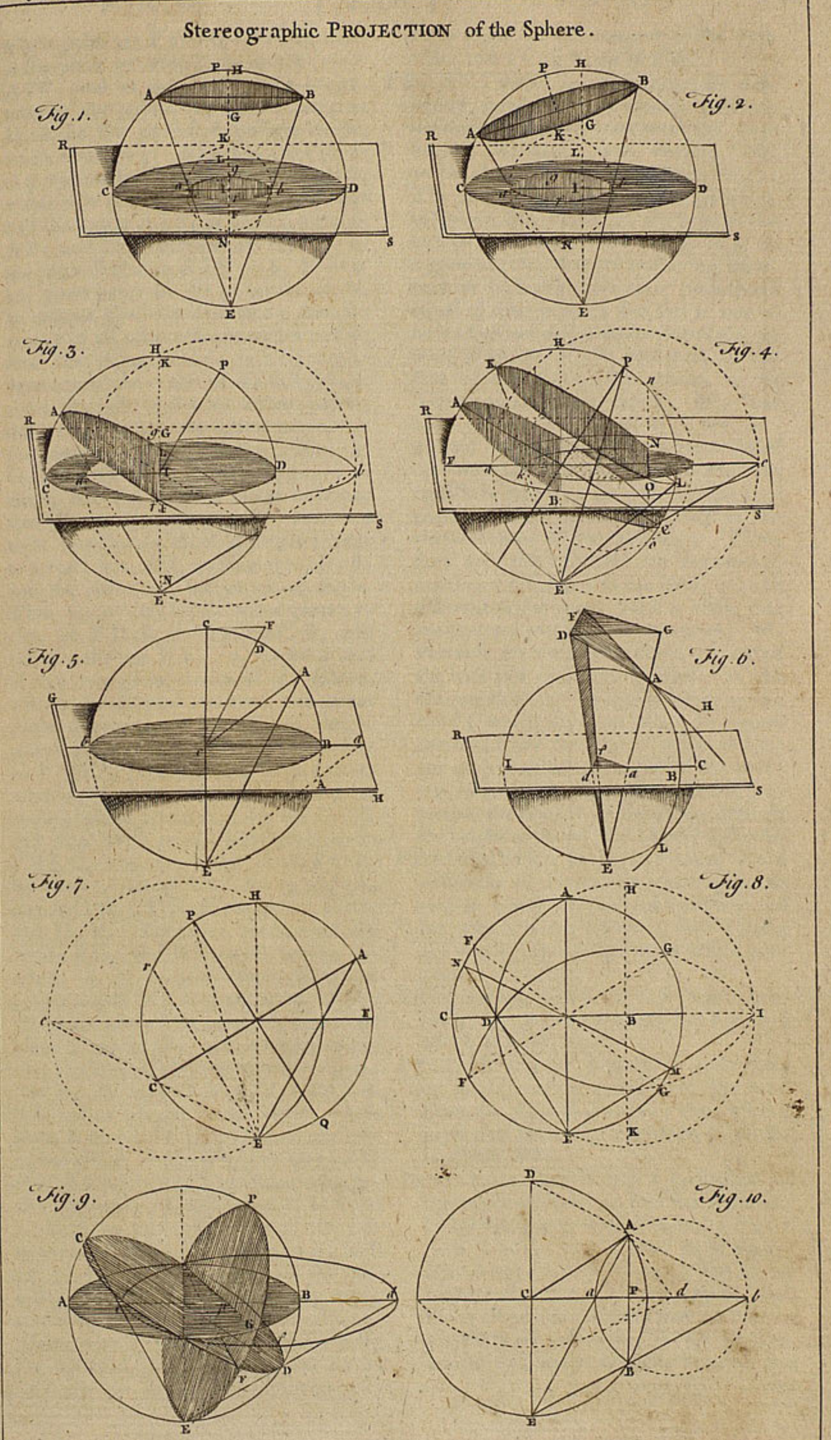
The projection of the sphere is either orthographic, or stereographic. See the articles ORTHOGRAPHIC and STEREOGRAPHIC, MAP, &c.

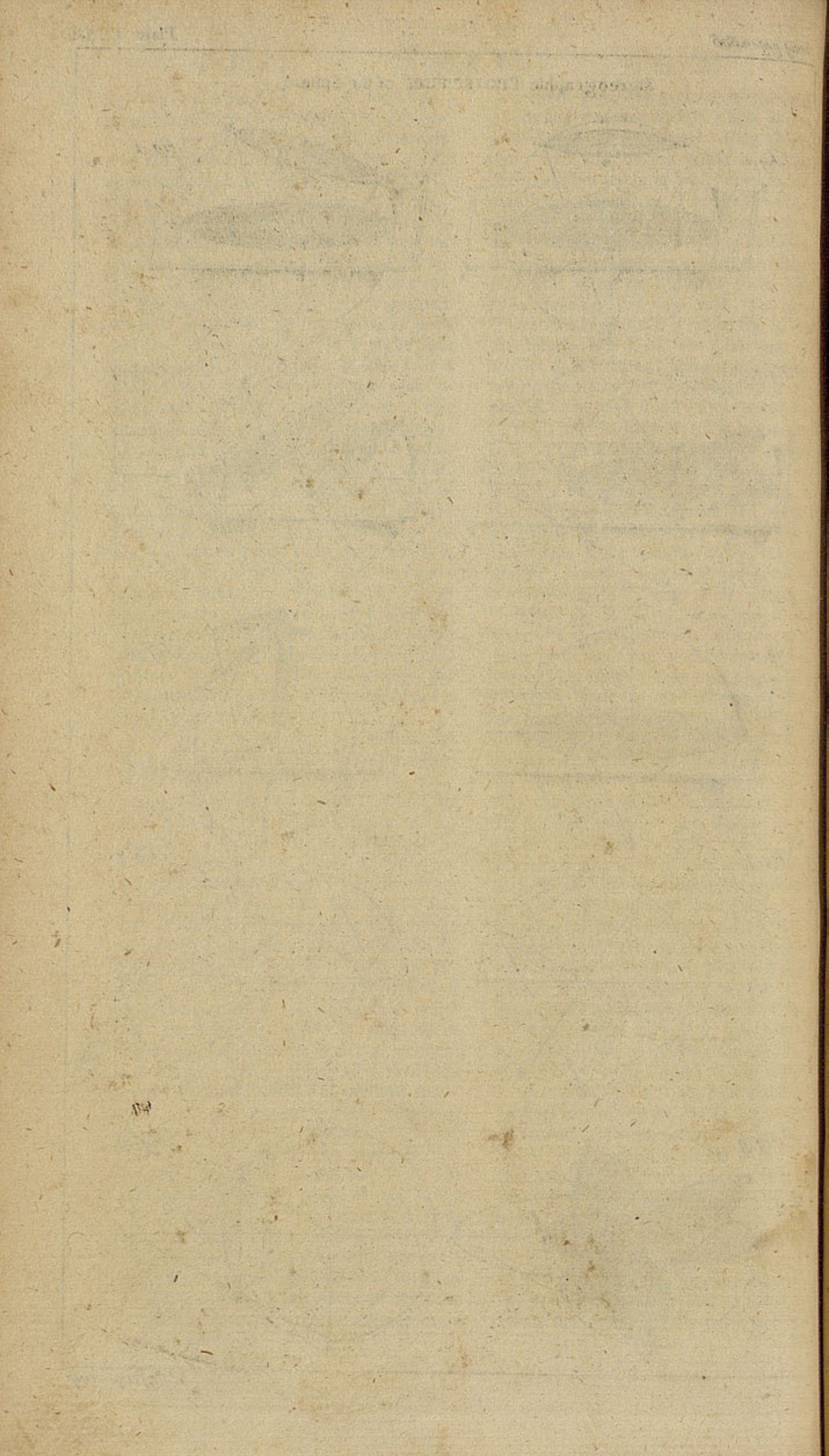
The former, or orthographic projection supposes the eye placed at an infinite distance; whereas, in the stereographic projection, it is supposed to be only 90° distant from the primitive circle, or placed in its pole, and thence viewing the circles on the sphere. The primitive circle is that great circle which limits or bounds the representation or projection; and the place of the eye is called the projecting point.

The laws of the orthographic projection are these: 1. The rays by which the eye, placed at an infinite distance, perceives any

any object are parallel. 2. A right line, perpendicular to the plane of the projection, is represented by a point, where it cuts the plane of the projection. 3. A right line, as A B, or C D, (pl. CCXIII. fig. 2. n° 1.) not perpendicular, is projected into a right line, as F E and G H, and is always comprehended between the extreme perpendiculars A F and B E, and C G and D H. 4. The projection of the right line, A B, is the greatest when it is parallel to the plane of projection; being projected in a right line equal to itself. 5. But an oblique line is always projected into one less than itself; and the more so, the nearer it approaches to a perpendicular, which, as already observed, is projected into a point. 6. A plane surface, as A B C D, (*ibid.* n°. 2.) at right angles to the plane of the projection, is projected into the right line A B, in which it cuts the plane of the projection; and any arch as B *c*, *c c*, or *c* A, is projected into the corresponding lines B *o*, *o o*, and *o* A. 7. A circle parallel to the plane of projection, is represented by a circle equal to itself; and a circle oblique to the plane of projection, is represented by an ellipsis: for the method of putting these rules in practice, see the article MAP.

As to the stereographic projection, its laws are these: 1. The representations of all circles, not passing thro' the projecting point, will be circles. Thus, let A C E D B (plate CCXII. fig. 1. 2. 3.) represent a sphere, cut by a plane R S, passing through the center I, at right angles to the diameter E H, drawn from E the place of the eye; and let the section of the sphere by the plane R S, be the circle C F D L, whose poles are H and E. Suppose now A G B is a circle on the sphere to be projected, whose pole most remote from the eye is P; and the visual rays from the circle A G B, meeting in E, form the cone A G B E, whereof the triangle AEB is a section thro' the vertex E, and diameter of the base A B: then will the figure *agbf*, which is the projection of the circle A G B, be itself a circle: for if the plane R S is supposed to revolve on the line C D, till it coincides with the plane of the circle A C E B; then will the circle C F D L coincide with the circle C E D H, and the projected circle *afbg* with the circle *a* N *b* K. Hence, the middle of the projected diameter, is the center of the projected circle, whether it be a great circle or a small one; the poles and centers of all circles, parallel to the plane of projection, fall in the center of the projection; and all oblique great circles cut the primitive circle in two points diametrically opposite. 2. The projected diameter of any circle subtends an angle at the eye equal to the distance of that circle from its nearest pole, taken on the sphere; and that angle is bissected by a right line, joining the eye and that pole. Thus let the plane R S (*ibid.* fig. 4.) cut the sphere H F E G, thro' its center I; and let A B C be any oblique great circle, whose diameter A C is projected in *ac*; and K O L, any small circle parallel to A B C, whose diameter K L is projected in *k l*. The distances of those circles from their pole P, being the arches A H P, K H P; and the angles *a* E *c*, *k* E *l*, are the angles at the eye, subtended by their projected diameters, *a c*, *k l*. Then is the angle *a* E *c* measured by the arch A H P, and the angle *k* E *l* measured by the arch K H P, and those angles are bissected by E P. 3. Any point of a sphere is projected at the distance of the tangent of half the arch intercepted between that point and the pole opposite to the eye, from the center of projection; the semi-diameter of the sphere being radius. Thus, let C *b* E B (*ibid.* fig. 5.) be a great circle of the sphere, whose center is *c*, G H the plane of projection cutting the diameter of the sphere in *b*, B; E, C, the poles of the section by that plane; and *a*, the projection of A. Then is *c a* = the tangent of half the arch AC, as is evident by drawing C F = the tangent of half that arch, and joining *c* F. 4. The angle made by two projected circles, is equal to the angle which these circles make on the sphere. For let I A C E and A B L (*ibid.* fig. 6.) be two circles on a sphere intersecting in A; E, the projecting point; and R S, the plane of projection, wherein the point A is projected in *a*, in the line I C the diameter of the circle A C E. Also let D H, F A, be tangents to the circles A C E, ABL. Then will the projected angle *daf* be equal to the spheric angle B A C. 5. The distance between the poles of the primitive circle and an oblique circle, is equal to the tangent of half the inclination of those circles; and the distance of their centers, is equal to the tangent of their inclination, the semi-diameter of the primitive being radius. For let A C (*ibid.* fig. 7.) be the diameter of a circle, whose


Stereographic PROJECTION of the Sphere.
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7.
Fig. 8.
Fig. 9.
Fig. 10.
T. Jefferys sculp.



whose poles are P and Q, and inclined to the plane of projection in the angle AIF; and let a, c, p, be the projections of the points A, C, P; also let HaE be the projected oblique circle, whose center is q. Now when the plane of projection becomes the primitive circle, whose pole is I; then is Ip = tangent of half the angle AIF, or of half the arch AF; and Iq = tangent of AF, or of the angle FHa = AIF. 6. If thro' any given point in the primitive circle, an oblique circle be described; then the centers of all other oblique circles passing thro' that point, will be in a right line drawn thro' the center of the first oblique circle at right angles to a line passing thro' that center, the given point, and the center of the primitive: thus let GACE (*ibid.* fig. 8.) be the primitive circle, ADEI a great circle described thro' D, its center being B. HK is a right line drawn thro' B perpendicular to a right line, CI, passing thro' D, B, and the center of the primitive circle. Then the centers of all other great circles, as FDG, passing thro' D, will fall into the line HK. 7. Equal arches of any two great circles of the sphere, will be intercepted between two other circles drawn on the sphere thro' the remotest poles of those great circles. For let PBEA (*ibid.* fig. 9.) be a sphere, whereon AGB, CFD, are two great circles, whose remotest poles are E, P; and thro' these poles let the great circle PBEC, and the small circle PGE, be drawn, intersecting the great circles AGB, CFD, in the points B, G, and D, F. Then are the intercepted arches BG, and DF equal to one another. 8. If lines be drawn from the projected pole of any great circle, cutting the peripheries of the projected circle and plane of projection, the intercepted arches of those circumferences are equal; that is, the arch GB = fd, (*ibid.*) 9. The radius of any small circle, whose plane is perpendicular to that of the primitive circle, is equal to the tangent of that lesser circle's distance from its pole; and the secant of that distance, is equal to the distance of the centers of the primitive and lesser circle. For let P (*ibid.* fig. 10.) be the pole, and AB the diameter of a lesser circle, its plane being perpendicular to that of the primitive circle, whose center is C: then d being the center of the projected lesser circle, da is equal to the tangent of the arch PA, and dC = secant of PA.

PROJECTURE, in architecture, the outjetting, prominency, or embossing, which the mouldings, and other members, have beyond the naked wall, column, *&c.* and is always in proportion to its height. The word is also applied to galleries, balconies, *&c.* which jet out beyond the face of the wall. Vitruvius gives it as a general rule, that all projecting members in building have their projectures equal to their height; but this is not to be understood of particular members, or mouldings, as dentils, coronas, the fasciæ of architraves, the abacus of the Tuscan and Doric capital, *&c.* but only of the projectures of intire corniches. Some modern architects are of opinion that the great point in building consists in knowing how to vary the proportions of projectures agreeably to the circumstances of the building. Thus, they say, the nearness and remoteness, making a difference in the view, require different projectures; but it is plain, that the antients had no such intention. M. Perrault observes, that the projecture of the base and corniche, is greater in the antique than the modern building by one third; which seems to follow in a good measure from the antients proportioning the projecture to the height of the pedestal, whereas the moderns make the projecture the same in all the orders, though the height of the pedestal be very different.

PROINDIVISO, in law, is taken for a possession of lands, *&c.* belonging to two or more, whereof none of them can say which is his portion; each having the whole, *&c.* as copartners before partition.

PROLABIA, FORE-LIPS, a term in anatomy, for that part of the labia or lips which jets out.

PROLAPSUS, in surgery, a prolapsion, or falling out of any part of the body from its natural situation: thus we say prolapsus intestini, a prolapsion of the intestine, *&c.*

PROLAPSUS ANI, is such a prolapsion of the intestinum rectum, that it is frequently inverted, or prolapsed to such a degree both in adults and infants, as to appear near a handbreadth hanging out of its natural situation. Heister thinks, that the cause of this disorder may be a great weakness or relaxation in the rectum, which frequently happens to cross and cla-

clamorous children, or from a tenefmus, violent pains of the piles, a dyfentery, a ftone, or ulcer in the bladder, a difficult expulfion of the birth, or the fæces, &c. The diforder is not difficult to cure when recent and the patient not weak; but in the contrary circumftances, to effect a perfect cure is next to impoffible. If a gangrene or cancer fhould infect the rectum, as in fuch cafes it may, the above mentioned author advifes the application of difcutient and emollient remedies; and if they prove unfuccefsful, an extirpation of the morbid part. The reduction of the inteftine, which fhould be effected as foon as poffible, is done and retained in the fame manner as is directed in returning and retaining the prolapfed inteftines in wounds of the abdomen. See the article ABDOMEN.

PROLAPSUS OCULI, is a deftemperature of the eye, in which it is fo violently inflamed and fwelled, that it cannot be contained in its orbit, but protrudes itfelf out of its natural feat. The caufes of this diforder are various, proceeding fometimes from a violent inflammation, or a redundancy of humours in the eye, from an obftruction of the reductory veffels, and fometimes from a fcirrhus, cancer, or fome external violence. When the diforder is recent, and occafioned by humours, they may be generally difperfed according to Heifter, by bleeding, purging, and veficatories, with internal attenuants and diluents, and external difcutient fomentations. But if the cafe is too obftinate to yield to remedies, recourfe muft be had to the chirurgical operation of the paracentefis, as in other dropfical cafes. See PARACENTESIS. At every dreffing a concave plate of lead muft be firmly fecured upon the eye, till it recover its natural figure. After the paracentefis, which our author choofes to do in the fclerotica, rather than the cornea, he dips his comprefs in fpirit of wine. When the eye is infected even to the root with a fcirrhus or cancer, there is no fafer method of relieving the patient, than by extirpating it clean out of the orbit, deterging and healing the wound in the manner directed under the article WOUND.

PROLAPSUS INTESTINI, or a prolapfion of the inteftine. See the articles ENTEROCELE and OSCHEOCELE.

PROLAPSUS OMENTI, or a falling of the omentum into the fcrotum. See the article EPIPLOCELE.

PROLAPSUS UTERI, is when the uterus falls down and appears out of the vagina; whereas when it only defcends into the vagina, it is termed a defcent, or bearing down of the womb. The apparent and moft general caufe of a prolapfus uteri is from too great a relaxation and weaknefs of its ligatures, and of the vagina, and is obferved moft frequently to follow a difficult labour, or other violent ftraining, tho' it may fometimes happen even to maids and young girls: as to the other fpecies of this diforder called the defcent of the womb, wherein the prolapfed uterus is inverted like a bag, fo that its internal furface appears outermoft, which at the fame times lies concealed in the vagina, it is never obferved but when the uterus is forced down together with the fecundines, or after a difficult labour; and if it is not fpeedily reduced, the cafe foon becomes paft cure, and kills the patient. In order to reduce the uterus, after the patient has difcharged her urine, fhe is to be placed in a proper pofture, and carefully feparating the placenta, if it adheres to the uterus, the latter is to be replaced with the fingers, by returning the pendulous part firft with the three middle fingers, and then with the whole hand into the cavity of the abdomen. When the parts have recovered their former fituation, the patient is to keep in bed, lying on her back, with her legs clofe together; and refting in this pofture is of itfelf very often fufficient: however it may not be improper to fecure the womb from falling down again, either in coughing, fneezing or otherwife, by retaining the lips of the pudenda together by a proper bandage. If there is an inflammation, bleeding and fomentation of the part with milk and water muft be ufed. This diforder is not fo dangerous when the womb appears externally from a relaxation of its ligaments, but without inverfion, and not in the time of labour, as it is not likely to be attended with inflammation or mortification; but when it happens in a weak habit, it is often impracticable to fuftain it in its proper fituation. In this cafe it muft be affifted by a proper bandage, and a retaining inftrument internally, fuch as a peffary, or any other inftrument for that purpofe. See the article PESSARY.

PROLAPSUS VAGINÆ, or a bearing down of the vagina, is often confounded with the prolapfus uteri, infomuch that they are

are often called by the ſame name; not being eaſily diſtinguiſhable from each other. Heiſter takes a prolapſus of the vagina to happen when that body appears either wholly or in part without the labia pudendi; and a total prolapſion ſhews itſelf without the relaxed labia like a fleſhy ring, red or bloody, and ſwelled more or leſs, according to particular circumſtances. With regard to the treatment, when it is without inflammation the prolapſed parts ſhould be returned without the leaſt delay, to prevent any inflammation, ſcirrhus, or gangrene, after being fomented with ſome aſtringent and diſcutient liquor; after which the patient ſhould keep her bed for ſeveral days, retaining her thighs cloſe together without moving her body. In ſome caſes it will be proper to heat the patient with ſome mineral waters of the chalybeat kind, and ſome preparations of ſteel; but if the diſorder is inveterate, endeavours muſt be uſed to palliate it, by ordering the patient conſtantly to wear the T bandage. See the article BANDAGE.

If the prolapſed parts are inflamed, diſcutient fomentations and cataplaſms are to be applied externally, and bleeding and the other internal medicines directed under the article INFLAMMATION.

PROLAPSUS UVULÆ, a diſorder of the uvula, which is ſometimes ſo much enlarged and elongated as even to reach the larynx, and pharynx, and obſtruct the actions both of reſpiration and deglutition. If it proceeds from a recent inflammation, as may be judged from the pain, heat, and redneſs of the circumjacent parts, the patient may be relieved with cooling gargles, and injections of wine and water, or a decoction of proper herbs with a little alum; but at the ſame time proper coolers muſt be uſed internally, with bleeding, purges, and clyſters, to prevent the inflammation from ſpreading thro' the fauces, and exciting a quinſy. When this diſorder continues, notwithſtanding the uſe of remedies, it will be neceſſary, depreſſing the tongue with a ſpatula, to clip off the redundant part of the uvula with a pair of ſciſſars; after which the blood being permitted to run a little time, it may be reſtrained by a gargle of warm wine, vinegar, or if it ſtill continues, apply a little alum, or a cautery, till the hæmorrhage ceaſes.

PROLATE, in geometry, an epithet applied to a ſpheriod produced by the revolution of a ſemi-ellipſes about its larger diameter. See the articles ELLIPSIS and SPHEROID.

PROLATION, in muſic, the art of ſhaking or making ſeveral inflections of the voice or ſound on the ſame note or ſyllable. See the article SINGING.

PROLEGOMENA, in philology, certain preparatory obſervations or diſcourſes prefixed to a book, &c. containing ſomething neceſſary for the reader to be appraiſed of, to enable him the better to underſtand the book, or to enter deeper into the ſcience, &c.

PROLEPSIS, πρόληψις, a figure in rhetoric, by which we anticipate or prevent what might be objected by the adverſary; thus, *it may be objected*, &c.

PROLEPTIC, προληπτικός, an epithet applied to a periodical diſeaſe which anticipates, or whoſe paroxyſm returns ſooner and ſooner every time, as is frequently the caſe in agues.

PROLIFIC, ſomething that has the qualities neceſſary for generating. See the article FERTILITY.

PROLIXITY, in diſcourſe, the fault of entering into too minute a detail, of being too long, preciſe, and circumſtantial, even to a degree of tedioufneſs.

PROLOCUTOR *of the convocation*, the ſpeaker or chairman of that aſſembly. See the article CONVOCATION.

There are two prolocutors of the convocation, one of the higher houſe, and one of the lower: the prolocutor of the lower houſe, immediately upon their firſt aſſembling, is choſen by the members of that houſe, and preſented to the higher houſe as their prolocutor; that is, the perſon by whom they intend to deliver their reſolutions to the higher houſe, &c. and to have their own houſe eſpecially regulated: in which reſpect his office is to call the names of thoſe that are of the houſe, as he ſees cauſe, to read all things propounded, gather ſuffrages, &c. The archbiſhop of Canterbury is by virtue of his office prolocutor of the higher houſe of convocation.

PROLOGUE, *prologus*, in dramatic poetry, a diſcourſe addreſſed to the audience before the drama or play begins. The original intention was to advertiſe the audience of the ſubject of the piece, and to prepare them to enter more eaſily into the action, and ſometimes to make an apology for the poet. This laſt article ſeems intirely to have taken poſſeſſion of the prologue in the britiſh drama. The French have left off the uſe of prologues;

logues: thofe few they ufe have nothing in them of the genuine prologue, as bearing no relation to the fubject, but being mere flourifhes of harangues in praife of the king, &c. In the antient theatre the prologus was properly the actor who rehearfed the prologue: the prologus was efteemed one of the dramatis perfonæ, and never appeared in the piece in any other character: the prologue, therefore, among them, though not an effential, was yet an acceffary part of the piece; with us it is no part at all, but fomething intirely diftinct and feparate: with them the drama was opened with the appearance of the prologus; with us it is not opened till after the prologus is retired. With us he always directs his fpeech to the audience, confidered as in a playhoufe; but with them he ought in propriety to have fpoken to a chorus of byftanders, or perfons to be prefent at the real action: but this being in a great meafure inconfiftent with the defign of a prologue, it was directed to the audience. The prologue is of much more antient ftanding than the epilogue. See the article EPILOGUE.

PROLUSION, in literature, a term applied to certain pieces or compofitions made previoufly to others, by way of prelude or exercife: thus Diomedes calls the Culex of Virgil, and his other opufcula, prolufions, becaufe written before the great ones.

PROM, a city of the kingdom of Ava, in the further India: eaft long. 94°, north lat. 19°.

PROMETHEUS, in the antient aftronomy, the name of the conftellation now called hercules. See HERCULES.

PROMISE, in law, is when upon any valuable confideration one binds himfelf by word of mouth to another to perform a thing agreed on. It is held upon fuch a promife that action will lie for breach, which will not if the promife be without confideration, that being a naked bargain, from which no action can arife. Here a promife againft a promife made at one and the fame time, is fufficient ground for an action. In cafe a verbal promife is made to do a thing, and there is no breach thereof, the fame may be difcharged by parol, or by word of mouth; but if the promife be once broke, it may not be difcharged without fome receipt or releafe: for it is then become a debt. When any action is grounded on a promife, there payment or other legal difcharge ought to be pleaded. See the article BARGAIN.

PROMONTORY, in geography, a high point of land or rock projecting out into the fea; the extremity of which towards the fea, is called a cape, or headland.

PROMOTERS, *promotores*, in a legal fenfe, are fuch as in popular or penal actions profecute offenders in their own names, and in that of the king's, as informers do; and who have part of the forfeitures or penalties for their reward. Thefe formerly belonged to the exchequer, but of late they have chiefly lifted themfelves under the banner of the excife.

PROMPT PAYMENT. See PAYMENT.

PROMPTER, in the drama, an officer pofted behind the fcenes, whofe bufinefs it is to watch attentively the actors fpeaking on the ftage, in order to fuggeft and put them forward, when at a ftand, to correct them when amifs, &c. in their parts.

PROMULGATED, or PROMULGED, fomething publifhed or proclaimed, and generally applied to a law, to denote the publifhing or proclaiming it to the people.

PRONAOS, in the antient architecture, a porch to a church, palace, or other fpacious building. See the article PORCH.

PRONATION, among anatomifts. The radius of the arm has two kinds of motions, the one called pronation, the other fupination. Pronation is that whereby the palm of the hand is turned downwards; and fupination, the oppofite motion thereto, is that whereby the back of the hand is turned downwards. The peculiar mufcles whereby pronation is performed are called pronatores, as thofe by which fupination is performed are termed fupinatores. See SUPINATOR, and the next article.

PRONATORS, *pronatores*, in anatomy, two mufcles of the radius, which ferve to turn the palm of the hand downwards, and are diftinguifhed by the names of rotundus and quadratus. The pronator quadratus, or tranfverfus, is a fmall flefhy mufcle, lying tranfverfely on the infide of the lower extremity of the fore arm. It is fixed by one fide in the long eminence at the lower part of the internal angle of the ulna, and by the other in the concave fide of the lower extremity of the radius. It is nearly as broad as it is long, and is wholly flefhy, without any mixture of tendinous fibres. The

pronator

pronator rotundus, or obliquus, is a ſmall muſcle more broad than thick, ſituated on the upper part of the ulna, oppoſite to the ſupinator brevis. It is fixed to the internal condyle of the os humeri, and from thence paſſes obliquely before the extremity of the tendon of the brachiæus, and reaches to the middle part of the convex ſide of the radius, where it becomes flat, and is inſerted below the ſupinator brevis, by an extremity almoſt altogether fleſhy.

PRONG-HOE, in huſbandry, the name of an inſtrument uſed to hoe or break the ground near and among the roots of plants. The prong-hoe conſiſts of two hooked points, of ſix or ſeven inches length; and when ſtruck into the ground, will ſtir and remove it the ſame depth as the plough does; and thus anſwer both the ends of cutting up the weeds, and opening the land. The prong-hoe comes into excellent uſe, even in the horſe-hoeing huſbandry; and in this the hoe-plough can only come within three or four inches of the rows of the corn, turneps, and the like; but this inſtrument may be uſed afterwards; and with it the land may be raiſed and ſtirred, even to the very ſtalk of the plant. See the articles HOE, HOEING, and PLOUGH.

PRONOUN, *pronomen*, in grammar, a declinable part of ſpeech, which being put inſtead of a noun, points out ſome perſon, or thing.

Pronouns are divided into the ſix following claſſes, *viz.* demonſtrative pronouns; relative pronouns; poſſeſſive pronouns; gentile pronouns, or ſuch as denote a perſon's country, as *noſtras*, *veſtras*, and *cujas*; interrogative pronouns, and reciprocal pronouns. See the articles DEMONSTRATIVE, RELATIVE, &c.

PRONOUNCING, or PRONUNCIATION, in painting, the marking and expreſſing the parts of all kinds of bodies with that degree of force, neceſſary to make them more or leſs diſtinct and conſpicuous.

PRONUNCIATION, *pronunciatio*, in grammar, the manner of articulating or ſounding the words of a language.

Pronunciation makes much the moſt difficult part of a written grammar; in regard that a book expreſſing itſelf to the eyes, in a matter that wholly concerns the ears, ſeems next akin to that of teaching the blind to diſtinguiſh colours; hence it is that there is no part ſo defective in grammar as that of the pronunciation, as the writer has frequently no term whereby to give the reader an idea of the ſound he would expreſs; for want of a proper term, therefore, he ſubſtitutes a vicious and precarious one. To give a juſt idea of the pronunciation of a language, it ſeems neceſſary to fix as nearly as poſſible all the ſeveral ſounds employed in the pronunciation of that language. Cicero tells us, that the pronunciation underwent ſeveral changes among the Romans; and indeed it is more precarious in the living languages, being, as Du Bos tells us, ſubſervient to faſhion in theſe. The French language is clogged with a difficulty in pronunciation from which moſt others are free; and it conſiſts in this, that moſt of their words have two different pronunciations, the one in common proſe, the other in verſe. See the article FRENCH, &c.

As to the pronunciation of the engliſh language, the ingenious Mr. Martin, in his Spelling-Book of Arts and Sciences, lays down the following rules: 1. The final (*e*) lengthens the ſound of the foregoing vowel; as in *can*, *cane*; *rob*, *robe*; *tun*, *tune*, &c. 2. The final (*e*) in words ending in *re*, is ſounded before the *r* like *u*; as *maſſacre*, *maſſa-cur*; *lucre*, *lu-cur*, &c. 3. The latin diphthongs *æ*, *œ*, are ſounded like *e*; as *Ætna*, *Etna*; *oeconomy*, *economy*, &c. but at the end of words *oe* ſounds like *o*; as in *toe*, *foe*, &c. 4. Alſo the engliſh improper diphthongs, *ea*, *eo*, *eu*, *ue*, ſound only the *e* and *u*; as *tea* or *te*, *feoffee* or *feffee*, *due* or *du*, *true* or *tru*, &c. tho' ſometimes *eo* and *ea* are pronounced like *ee*, as in *people*, *fear*, *near*, &c. 5. Sometimes the diphthong (*ie*) is pronounced like *e* in *cieling*, like *ee* in *field*, and, at the end of words, always like *y*; as in *lie*, &c. and *ei* is pronounced either like *e* or *ai*; as in *deceit*, *reign*, &c. 6. The triphthong *eau* is pronounced like *o*, in *beau* and *jet d'eau*; and *ieu* ſounds like *u* in *lieu*, *adieu*, &c. 7. The ſound of *c* is hard before the vowels *a*, *o*, *u*; as in *call*, *cold*, *cup*, &c. alſo ſometimes before *h*, as in *chart*, *chord*, &c. and before *l* and *r*; as in *clear*, *creep*, &c. It is otherwiſe generally ſoft, as in *city*, *cell*, *cyder*, *child*, &c. 8. In french words *ch* is ſounded like *ſh*; as in *chagreen*, *machine*; and ſometimes like *qu*, as in *choir*. 9. The ſound of *g* is hard before *a*, *o*, *u*, *l*, *r*; as in *gall*, *go*, *gum*, *glean*, *grope*; alſo before *ui*, as in *guilt*, *guild*, &c. and before *h*, as in *ghoſt*; ſometimes before *i*, as in *gibbous*, *gibberiſh*. It is alſo

alſo generally hard before *e*; as in *get*, *geld*, &c. but ſoft in many words derived from the greek and latin, as in *geometry*, *genealogy*, *genus*, &c. Two *gg* are always hard, as in *dagger*, &c. The ſound of *g*, when ſoft, is like that of *j*. 10. In any part of a word, *ph* ſounds like *f*, as in *philoſophy*, &c. 11. The ſound of *qu*, at the end of french words, is like *k*, as in *riſque*, &c. 12. The ſyllables *ti* and *ci*, if followed by a vowel, ſound like *ſi* or *ſhi*; as in *fiction*, *logician*, &c. 13. When *cc* occurs before *i*, the firſt is hard and the latter is ſoft; as in *flaccid*, &c. 14. The latter *p* is not pronounced at the beginning of ſyllables, before *ſ* and *t*; as in *pſalm*, *ptarmics*, &c. As to other peculiarities, regarding the pronunciation of ſingle letters, many of them have been taken notice of at the beginning of each, in the courſe of this work.

But it is not enough to know the juſt pronunciation of ſingle letters, but alſo of words; in order to which, the accenting of words ought to be well underſtood; ſince nothing is more harſh and diſagreeable to the ear, than to hear a perſon ſpeak or read with wrong accents: and, indeed, in engliſh, the ſame word is often both a noun and a verb, diſtinguiſhed only by the accent, which is on the firſt ſyllable of the noun, and on the laſt of the verb; as *fèrment* and *fermènt*, *rècord* and *recòrd*, &c. We are to obſerve alſo, that in order to a juſt expreſſion of words, ſome require only a ſingle accent on the long ſyllable; as in *tòrment*, &c. but in others it ſhould be marked double, as in *aǹimal*, becauſe it is pronounced as if the letter was wrote double, viz. *annimal*.

PRONUNCIATION is alſo uſed for the fifth and laſt part of rhetoric, which conſiſts in varying and regulating the voice agreeably to the matter and words, ſo as moſt effectually to perſuade and touch the hearers. It is much the ſame with what is otherwiſe called emphaſis. See the article EMPHASIS.

This emphaſis is a conſiderable ſtreſs or force of voice, laid upon that word in a ſentence, by which the ſenſe of the whole is regulated: thus, ſuppoſe you were aſked, *are you determined to walk this day to London?* If the emphaſis be placed on the word *you*, the anſwer may be, *yes, I go myſelf*; or *no, I ſhall ſend my ſon*. Again, if it be placed on the word *walk*, the anſwer is, *yes, I am*; or *no, I ſhall ride*: if on the words *to day*, then the anſwer is, *yes*; or *no, I ſhall go to morrow*: and, laſtly, if the emphaſis be placed on the word *London*, the anſwer may be, *no, I ſhall go to Richmond only*.

Quintilian adviſes his pupils to ſtudy the principles of pronunciation under a comedian. There are three things which come under the pronunciation, *viz.* the memory, voice, and geſture. See the articles MEMORY, *&c.*

PRONUNCIATION, in painting. See the article PRONOUNCING.

PROOF, in arithmetic, an operation whereby the truth and juſtneſs of a calculation is examined and aſcertained. The proper proof is always by the contrary rule: thus ſubſtraction is the proof of addition, and multiplication of diviſion; and *vice verſa*. See the articles ADDITION, SUBSTRACTION, *&c.*

PROOF, in law, *&c.* denotes the mediums or arguments uſed to evince the truth of any thing. In law proof is two-fold, *viz.* *viva voce*, by living witneſſes, and *probatio mortua*, a dead proof; ſuch is that of records, deeds, or other writings. Though ſome have been of opinion, that the law takes no notice of any other proof than that before a jury in a judicial way, and that which is on record; yet if it be agreed by the parties that the proof ſhall be made in ſuch a manner, or before a particular perſon, that form is to be obſerved, and ſhall prevail againſt what is uſually termed legal proof. In common agreements, *&c.* a perſon may bring his action, and therein aver that a certain thing was done, on which the defendant may take iſſue that the thing was not done, and then the plaintiff at the trial muſt make proof of the doing it. See the article EVIDENCE.

In the French law, the depoſition of one witneſs, or of a perſon deceaſed, makes what they call a ſemi-proof, or half proof; which in heinous caſes, frequently determines them to try the torture. See the article TORTURE.

PROOF is alſo uſed in a ſynonymous ſenſe with ſtandard: thus we call that proof-ſpirit, which is of the ſtandard ſtrength, or half alcohol half phlegm. See the articles SPIRIT, BRANDY, and DISTILLATION.

PROPAGATION, *propagatio*, the act of multiplying the kind, or of producing the like in the natural way of generation. See the article GENERATION.

PROPER, *proprium*, ſomething naturally

and eſſentially belonging to any thing. The ſchoolmen diſtinguiſh four kinds of propers, or modes of propriety: the firſt called *proprium primo modo*, is what agrees to a ſingle ſpecies, but not to all the individuals; the ſecond, *proprium ſecundo modo*, is what agrees to the whole ſpecies, but agrees likewiſe to one another; the third, *proprium tertio modo*, is what agrees to a ſingle ſpecies, but not at all times; and the laſt and higheſt, *proprium quarto modo*, is that which alone agrees to one kind, to all the individuals thereof, and at all times.

PROPER, in reſpect of words, denotes their immediate and peculiar ſignification; or that directly and peculiarly attached to them; in which ſenſe, the word ſtands oppoſed to figurative.

PROPER, in grammar, is alſo applied to nouns, or names, which are diſtinguiſhed into proper and appellative. See the article APPELLATIVE.

Man is the appellative, John the proper name.

PROPER FRACTION. See FRACTION.

PROPER, in the civil juriſprudence, is uſed in oppoſition to acquired, for an inheritance derived by direct or collateral ſucceſſion.

PROPERTY, *proprietas*, in a general ſenſe, that which conſtitutes or denominates a thing proper; or it is a particular virtue or quality which nature has beſtowed on ſome things excluſive of all others: thus colour is a property of light; extenſion, figure, diviſibility, and impenetrability, are properties of body, &c. See the article LIGHT, &c.

PROPERTY, in law, is defined to be the higheſt right a perſon has, or can have, to any thing; it being uſed to denote that right which one has to lands or tenements, goods or chattels, in no reſpect depending upon another's curteſy. At this day property in lands, &c. is acquired either by entry, deſcent, law, or conveyance; and in goods and chattels property may be gained divers ways, though generally it is by deed of gift, or bargain and ſale.

There are held to be three manner of properties, 1. Abſolute property, which is where the proprietor has an abſolute power veſted in himſelf to diſpoſe of his eſtate as he pleaſes, ſubject to the laws of the land. 2. Qualified property, as in the caſe of huſband and wife, wherein the huſband has only a qualified property in the wife's lands, real chattels, &c. but in her perſonal chattels he has an abſolute property. 3. Poſſeſſory property, as when a perſon has goods delivered to him to keep, he has ſuch a property therein, that he may maintain actions againſt ſtrangers who take them out of his poſſeſſion. It is likewiſe the ſame when they are delivered to a carrier, or things are pawned. See the articles PAWN and BROKER.

Every owner of goods has undoubtedly a general property in them; but yet a legatee in a will hath no property in the goods bequeathed him, until ſuch time as they are delivered to him by the executor, ſo that he has the poſſeſſion. In the ſale of any thing, no property is veſted in the buyer till there is an actual delivery. If a perſon hires a horſe for ſo many days, he hath, during that time, a ſpecial property in the beaſt, and might have an action againſt even the maſter of it, did he diſturb him in his poſſeſſion. Where a perſon borrows or finds another man's goods, or in caſe one takes them from another, none of theſe acts will alter the property; though ſhould a perſon take corn from another, and convert it into malt, or turn timber into a houſe, &c. in theſe caſes the property becomes altered.

PROPHECY, προφητεια, a prediction made by divine inſpiration.

Mr. Whiſton condemns all allegorical explanation of the prophecies of the Old Teſtament cited in the New, as weak, enthuſiaſtic, &c. and adds, that if a double ſenſe of the prophecies be allowed, and there be no other method of ſhewing their completion than by applying them ſecondarily and typically to our Lord, after having been in their firſt and primary intention long ago fulfilled in the times of the Old Teſtament, we loſe all the real advantages of the antient prophecies as to the proof of chriſtianity. He therefore ſets up a new ſcheme in oppoſition thereto: he owns that taking the preſent text of the Old Teſtament for genuine, it is impoſſible to expound the apoſtles citations of the prophecies of the Old Teſtament on any other than the allegorical foundation; and therefore to ſolve the difficulty, he is forced to have recourſe to a ſuppoſition contrary to the ſenſe of all chriſtian writers before him, *viz.* that the text of the Old Teſtament has been greatly corrupted ſince the apoſtolical age by the Jews.

Perſons pretending to prophecies, are puniſh-

punishable at common law; by statute, likewise, if any person publish such prophecies with an intent to raise sedition, they shall forfeit 10 l. for the first offence, and suffer a year's imprisonment; and for the second, incur the forfeiture of all their goods, &c.

PROPHET, προφήτης, in general, a person who foretels future events, but is particularly applied to such inspired persons among the Jews as were commissioned by God to declare his will and purposes to that people. Among the canonical books of the Old Testament, we have the writings of sixteen prophets, four of which are denominated the greater prophets, *viz.* Isaiah, Jeremiah, Ezekiel, and Daniel, so called from the length or extent of their writings, which exceed those of the others, *viz.* Hoseah, Joel, Amos, Obadiah, Jonas, Micah, Nahum, Habakkuk, Haggai, Zachariah, and Malachi, who are called the lesser prophets, from the shortness of their writings. The Jews do not place Daniel among the prophets, because, they say, he lived the life of a courtier rather than that of a prophet. An account of the several writings of the prophets may be seen each under its particular head. See the article Isaiah, &c.

PROPHYLACTICE, προφυλακτικη, in medicine, that part thereof which instructs as to the method of preserving health and averting diseases.

PROPITIATION, in theology, a sacrifice offered to God to asswage his wrath, and render him propitious. Among the Jews there were both ordinary and public sacrifices, as holocausts, &c. offered by way of thanksgiving; and extraordinary ones, offered by particular persons guilty of any crime, by way of propitiation. The romish church believe the mass to be a sacrifice of propitiation for the living and the dead. The reformed churches allow of no propitiation but that one offered by Jesus Christ on the cross. Propitiation was also a feast among the Jews, celebrated on the tenth of the month Tisri, in commemoration of the pardon proclaimed to their forefathers by Moses on the part of God, who thereby remitted the punishment due to the crime of their worshipping the golden calf.

PROPITIATORY, or Mercy-seat, among the Jews, was the cover or lid of the ark of the covenant. See Ark. The cherubims spread their wings over the propitiatory.

PROPLASM, is sometimes used for a mould where any metal or soft matter, which will afterwards grow hard, is cast: hence,

PROPLASTICE, the art of making moulds for casting things in.

PROPOLIS, the name of a certain substance more glutinous and tenacious than wax, with which the bees stop up all the holes or cracks in the sides of their hives. Besides the wax and the honey which the bees gather in their daily travels, they have occasion for this third substance at times, and that especially when they are placed in a new hive. They not only stop in this manner all the cracks they can find, but even examine all the weak places of the hive, and will eat away a rotten part, to make up the deficiency with this propolis. It appears from the observations of Reaumur, that the propolis is a substance perfectly different from wax, and is a true genuine vegetable resin, of a brownish-red colour on the surface, and when broken, approaching to the colour of wax, carried home by the bees in lumps in the same manner in which they carry their wax. The apothecaries in some places keep this as a medicine in their shops. It readily dissolves in spirit of wine, or oil of turpentine: this solution is of a fine gold-colour, and will serve as a varnish to colour silvered picture-frames, or the like work.

PROPONTIS, or *sea of* Marmora, divides Europe from Asia, having the Bosphorus on the north-east, by which it has a communication with the Euxine sea, and the Hellespont on the south-west, by which it communicates with the Archipelago. It is one hundred and twenty miles long, and in some places upwards of forty broad.

PROPORTION. When two quantities are compared one with another, in respect of their greatness or smalness, the comparison is called ratio, reason, rate, or proportion: but when more than two quantities are compared, then the comparison is more usually called the proportion that they have to one another. The words ratio and proportion are frequently used promiscuously.

When two quantities only are compared, the former term is called the antecedent, and the latter the consequent.

The relation of two homogeneous quantities one to another, may be considered either, 1. By how much the one exceeds

ceeds the other, which is called their difference. Thus 5 exceeds 3 by the difference 2. Or, 2. What part or parts one is of another, which is called ratio. Thus the ratio of 6 to 3 is $\frac{6}{3}=\frac{2}{1}$, or double; and the ratio of 3 to 6 is $\frac{3}{6}=\frac{1}{2}$, or fubduple.

When two differences are equal, the terms that compofe them are faid to be arithmetically proportional. Thus fuppofe the term to be a and b, their difference d. If a be the leaft term, then $a+d=b$. And if a be the greateft, then $a-d=b$.

But when two ratios are equal, the terms that compofe them are faid to be geometrically proportional. For fuppofe a and b to be the terms of any ratio; if a be the leaft term, put $r=\frac{b}{a}$, then $ar=b$ by equal multiplication: but if b be the leaft term, put $r=\frac{a}{b}$, then $br=a$ by equal multiplication, and $\frac{a}{r}=b$ by equal divifion.

Thus the ratio of two quantities, or of two numbers, in geometrical proportion, is found by dividing the antecedent by the confequent, and the quotient is the exponent or denominator of the ratio.

Proportions, fo many of them as are rational, or between number and number, have particular names given them by the greek and latin writers. Thus, if after the antecedent be divided by the confequent, the quotient be 1, it is called proportion of equality, or fimple proportion. If the quotient be 2, 3, 4, (or any other integral number) it is called multiple proportion (*viz.* double, triple, quadruple, &c.) and the contrary to thofe are called fub-multiple, (*viz.* fub-duple, fub-triple, fub-quadruple, &c.) or one half, one third, one fourth, or other fuch aliquot part.

If the quotient be 1, with one fuch part, as $1\frac{1}{2}$, $1\frac{1}{3}$, $1\frac{1}{4}$, &c. it is called fuperparticular (*viz.* fefquialteral, fefquitertian, fefquiquartan, &c.) and the contraries hereunto are called fub-fuperparticular (*viz.* fub-fefquialteral, fub fefquitertian, &c.)

If fuch quotient be 2, 3, 4, (or fuch other integer greater than unity) with fuch an aliquot part it is called multiple-fuperparticular (as $2\frac{1}{2}$ duple-fefquialteral, $3\frac{1}{3}$ triple-fefquitertian, $3\frac{1}{4}$ triple-fefquiquartan, &c.) and the contraries thereunto are fub-multiple-fuperparticular, as fubduple-fefquialteral, fubtriple-fefquitertian, &c.

If the quotient be 1, with fome number of aliquot parts, as $1\frac{2}{3}$, $1\frac{3}{4}$, $1\frac{2}{5}$, &c. it is called fuperpartient, (as fuperbipartiens tertias, fuper-tripartiens quartas, fuperbipartiens quintas, &c.) and the contraries hereunto are fub fuperpartient, as fub-fuperbipartiens tertias, &c.

If fuch quotient be fome greater integer number, (as 2, 3, &c.) with fuch number of aliquot parts, as $2\frac{2}{3}$, $3\frac{3}{4}$, $3\frac{2}{5}$, &c. it is called multiple-fuperpartiens, (as dupla-fuperbipartiens tertias, tripla-fupertripartiens quartas, tripla-fupertripartiens quintas, &c.) And the contraries thereunto, fubmultiple-fuperpartient, (as fubdupla-fuperbipartiens tertias, fubtripla-fupertripartiens quartas, &c.) as that of 31 to 7 (becaufe $\frac{31}{7}=4\frac{3}{7}$) is quadruple-fupertripartiens feptimas; and its contrary, 7 to 31, is fub-quadruple-fupertripartiens feptimas. And under fome of thefe compellations all proportions will fall, which are as one integer number to another.

But it is much better, and more intelligible, to exprefs thefe proportions, as the ufual manner now is, by the numbers themfelves, than by thefe names, as 31 to 7, or 7 to 31.

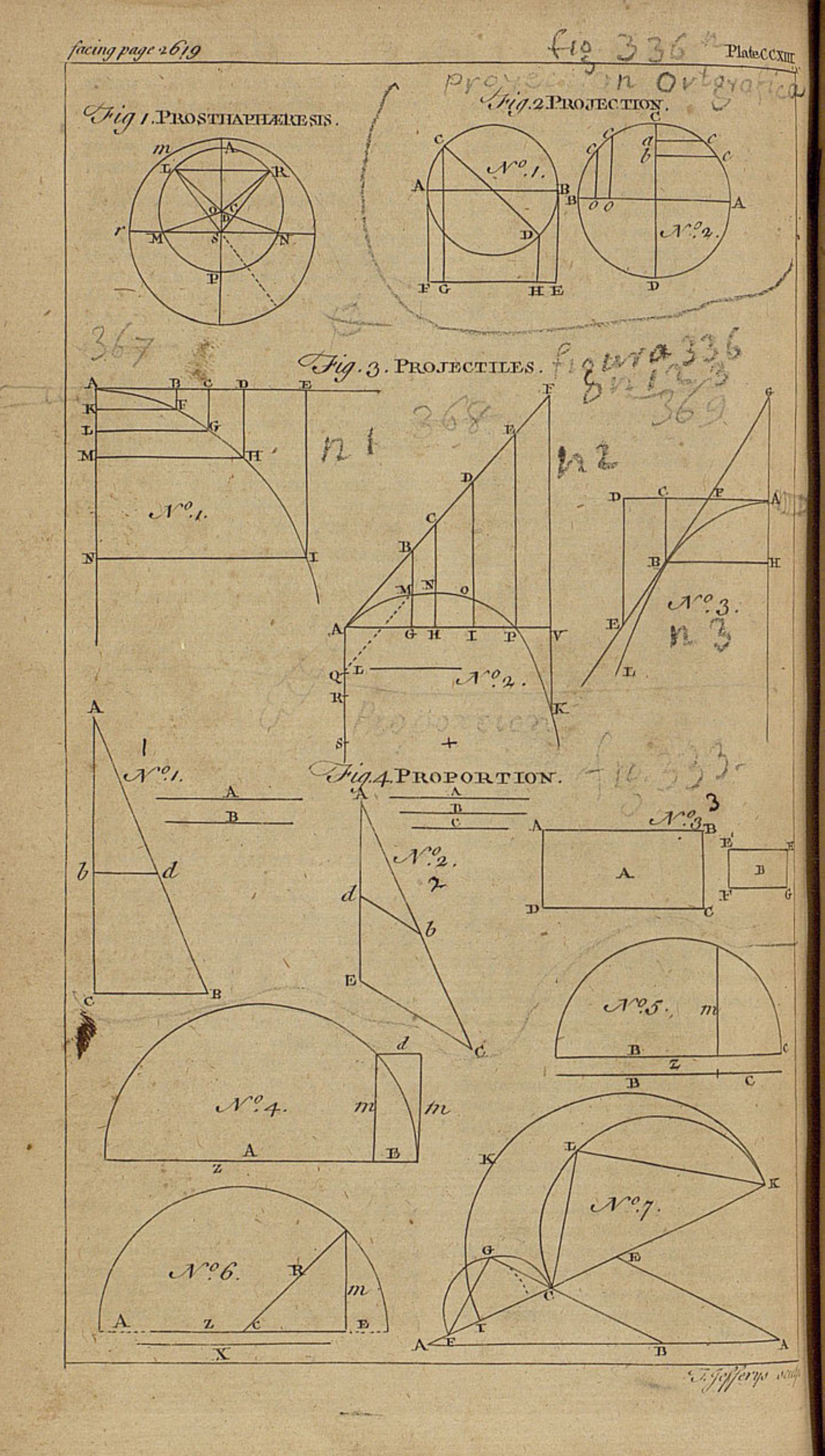
If when four quantities are confidered, you find that the firft hath as much greatnefs or fmalnefs in refpect to the fecond, as the third hath in refpect to the fourth: thofe four quantities are called proportionals, and are thus expreffed.

As $\left\{\begin{array}{c} A : B : : C : D \\ \hline 8 : 2 : : 16 : 4 \end{array}\right\}$ that is, as $A=8$ contains $B=2$ four times, fo $C=16$ contains $D=4$ four times; and therefore A has the fame ratio to B, as C has to D; and confequently, thefe four quantities having equal ratios, are proportionals.

Proportion confifts of three terms at leaft, whereof the fecond fupplies the place of two.

When three magnitudes, A, B, C, are proportional, the firft A has a duplicate ratio to the third C, of that it hath to the fecond B: but when four magnitudes, A, B, C, D, are proportional, the firft A has a triplicate ratio to the fourth D, of what it has to the fecond B; and fo always in order one more, as the proportion fhall be extended.

Duplicate ratio is thus expreffed, $\frac{A}{C}=\frac{A}{B}$ twice; that is, the ratio of A to C is duplicate


facing page 2619
Plate CCXIII
Fig 1. Prosthaphæresis.
Fig. 2 Projection.
No. 1.
No. 2.
Fig. 3. Projectiles.
No. 1.
No. 2.
No. 3.
Fig. 4. Proportion.
No. 1.
No. 2.
No. 3.
No. 4.
No. 5.
No. 6.
No. 7.
T. Jefferys sculp.

portionals, whofe common difference is d.

And $\left\{\begin{matrix} a, ar, arr, arrr, arrrr, ar^5 \\ a, \frac{a}{r}, \frac{a}{rr}, \frac{a}{rrr}, \frac{a}{rrrr}, \frac{a}{r^5} \end{matrix}\right\}$

&c. is a feries of continued geometric proportionals, whofe common multiplier is $\frac{r}{1}$ or $\frac{1}{r}$, or whofe ratio is that of 1 to r, or r to 1.

Note, that the fign $\div\!\!\div$, fignifies continued proportion.

Again, when of feveral quantities the difference or quotient of the 1ft and 2d is the fame with that of the 3d and 4th (and not of the 2d and 3d) they are faid to be in a difcontinued arithmetic, or geometric proportion; fuch as

1 $\left\{\begin{matrix} a, a+d; e, e+d \\ a+d, a; e+d, e \end{matrix}\right\}$ for $\left\{\begin{matrix} \overline{a+d}-a=\overline{e+d}-e \\ =d. \end{matrix}\right\}$

2 $\left\{\begin{matrix} a, ar; e, er; \\ ar, a; er, e; \end{matrix}\right\}$ for $\left\{\begin{matrix} \frac{a}{ar}=\frac{e}{er}=\frac{1}{r} \\ \frac{ar}{a}=\frac{er}{e}=\frac{r}{1} \end{matrix}\right\}$

Problem I. To two lines A and B, to find a third proportional D (plate CCXIII. fig. 4. n° 1.) make any right-lined angle, as C A B, then fet off in A B, A d=A, and on A C, ab=B. Set off alfo dB=B on A B; then join $b\,d$, and through B draw a line parallel to $b\,d$, fo fhall bC be the third proportional required, for A : B : : B : D by 2, 6, Eucl.

Prob. II. To three given lines A, B, and C, to find a fourth proportional D. Make any angle, C A E (*ibid.* n° 2.); then from A take A b=A, and b C=B, and Ad=C; join $b\,d$, and through C draw CE parallel to $b\,d$; fo fhall dE be the line fought: for A : B : : C : D. 2, 6, Euclid.

Proportion *of figures*. Prob. I. To find the proportion that one rectangle hath to another, both length and breadth muft be confidered. For rectangles are to each other, as the products of their refpective lengths multiplied by their breadths.

1, Thus, if there be two rectangles, the former of which hath its length five feet, and its breadth three; and the latter hath its length eight feet, and its breadth four. Then the rectangles will be to each other as 3 × 5 (=15), is to 4 × 8 (=32) that is, as 15 : 32, fo that all the rectangles are to one another in a ratio compounded of that of their fides.

2. When rectangles have their fides proportionable, fo that $\frac{\text{AB}}{8} : : \frac{\text{EH}}{4} : : \frac{\text{AD}}{4} : \frac{\text{EF}}{2}$, then is the rectangle A, (n° 3.) to the rectangle B, in a duplicate proportion to the ratio of the fides.

For the ratio of A to B, is compounded of the ratio of A B to E H, and of the ratio of A D to E F. And therefore the proportion of A to B, being compounded of equal ratios, muft be duplicate of the ratio of their fides to each other; that is, duplicate of the ratio of A B : E H, or of A D : E F.

Hence all triangles, parallelograms, prifms, parallelopipeds, pyramids, cones, and cylinders, are to one another refpectively compared, in a proportion compounded of that of their heights and bafes.

3. All triangles, and parallelograms, pyramids, prifms, and parallelopipeds; alfo all cones, and cylinders, each kind compared among themfelves; if they have equal altitudes, are in the fame proportion as their bafes; if they have equal bafes, are as their heights.

For the bafes, or heights, will feverally be common efficients or multipliers; and therefore muft make the products be in the fame proportion as the multiplicand was before.

Thus, if the equal altitude of any two triangles, parallelopipeds, cones, &c. be called A, and their unequal bafes B, and D: then it will be as B : D : : A B : A D.

This problem being of great ufe, ought to be placed among the elements of geometry.

Cafe I. To find two right-lines, whofe fum or difference is given, reciprocally proportional to two given lines. Let the two given lines be B and C, and let the fum of the two lines fought be Z: it is required to find a point where Z may be fo divided, as that B : A : : E : C. (no 4.)

Firft find m, a mean proportional between B and C, which erect perpendicularly at either end of Z, (n° 5.) draw D parallel to Z, defcribe a femi-circle upon Z, and where D cuts that femi-circle, let fall m perpendicularly: then I fay A and E are the lines required: for A E=m^2=B C. *Q. E. D.*

Cafe II. When the difference = X is given, (n° 6.) find m a mean proportional as before, which erect perpendicularly at either end of X: thus draw R from the middle point of X to M, and with that as radius defcribe a femi-circle

circle on the center C: so shall A + X be the greater line, and E the lesser sought, for $A + X \times E = m^2 = BC$. *Q. E. D.*

Prob. II. Having two squares, to find two others reciprocally proportional, whose sum is equal to a given square.

Let the squares given be $b\,b$, $c\,c$, and the reciprocals required $y\,y$ and $d\,d - y\,y$, then,

$$yy : bb : cc : dd - yy$$
$$ddyy - y^4 = bbcc$$
$$y^4 - ddyy + \tfrac{1}{4}d^4 = \tfrac{1}{4}d^4 - bbcc$$
$$\tfrac{1}{2}d^2 - y^2 = \sqrt{\tfrac{1}{4}d^4 - bbcc}$$
$$y^2 = \tfrac{1}{2}d - \sqrt{\tfrac{1}{4}d^4 - bbcc}$$
$$y = \sqrt{\tfrac{1}{2}d^2 - \sqrt{\tfrac{1}{4}d^4 - bbcc}}$$

The construction of this is as follows. let AB (n° 7.) $= d$, and $AC = b$, and $BD = c$, find a fourth proportional, as $CE = \frac{bc}{d}$, and on $CF = \frac{1}{2}d$ describe a semi-circle, and in it apply $CG = CE$, then FG will be equal $\frac{\sqrt{\frac{1}{4}d^4 - b^2c^2}}{d}$

Let $HC = d$, and $CI = \frac{1}{2}d - \sqrt{\frac{1}{4}d^4 - b^2c^2}$, the mean proportional will be $CK = y$, and on $CH = d$ describe a semi-circle, and in it apply $CL = CK$, then $LH = \sqrt{d^2 - y^2}$, which is the side of the other square sought.

Prob. III. Having two squares, to find two other reciprocals whose difference shall be equal to a given square.

Let the squares given be ff, gg, and the reciprocals sought yy and $hh + yy$, then,

$$yy : ff :: gg : hh + yy$$
$$y^4 + hhyy = ffgg$$
$$y^4 + hhyy + \tfrac{1}{4}h^4 = ffgg + \tfrac{1}{4}h^4$$
$$y^2 + \tfrac{1}{2}h^2 = \sqrt{ffgg + \tfrac{1}{4}h^4}$$
$$y^2 = \sqrt{ffgg + \tfrac{1}{4}h^4} - \tfrac{1}{2}h^2$$
$$y = \sqrt{\sqrt{ffgg + \tfrac{1}{4}h^4} - \tfrac{1}{2}h^2}.$$

The construction of this is almost the same as in the preceding problem.

Of the proportion of solids, every parallelopiped, is to a pyramid of the same base and height, as 3 to 1, that is, the one is triple the other.

A cylinder, spheroid, and cone, of the same base and height, are as 3, 2, and 1.

Harmonic PROPORTION, is when three terms are so disposed, that as the diff. of the first and second : the diff. of the second and third :: first : third; and they are said to be harmonically proportional. Thus, 10, 15, 30, are harmonically proportional. For as the diff. of 16 and 15, is to the diff. of 15 and 30, so is 10 to 30. Also 12, 6, 4, are harmonically proportional; for 12 − 6 : 6 − 4 :: 12 : 4. So $b^2 + 3bn + 2n^2$, $b^2 + 2bn$, $b^2 + bn$, are harmonically proportional. For $bn + 2n^2 : bn :: b^2 + 3bn + 2n^2 : b^2 + bn$. Whence if the two first terms of an harmonic proportion be given, the third is readily found.

For if A, B, C, be harmonically proportional. Then $A - B : B - C :: A : C$, and $AC - BC = AB - AC$. Therefore $AB = 2A - B \times C$, and $BC = 2C - B \times A$. Consequently $C = \frac{AB}{2A - B}$, and $A = \frac{BC}{2C - B}$. Again, when four terms are so disposed, that as the diff. of the 1st and 2d : the diff. of the 3d and 4th :: 1st : 4th they are also harmonically proportional. As 10, 16, 24, 60; for as 10 − 16 : 24 − 60 :: 10 : 60. Whence if the three first terms of such an harmonic proportional be given, the 4th is easily found.

For if a, b, c, d, be harmonic proportionals, then $a - b : c - d :: a : d$; and $ad - bd = ac - ad$, therefore $d = \frac{ac}{2a - b}$, and $a = \frac{bd}{2d - c}$.

If the terms of an harmonic proportion be continued, then it is called an harmonic progression. Thus, supposing $\left\{\begin{array}{l} b, \text{ to be the 2d term,} \\ d, \text{ the difference of the 1st and 2d} \end{array}\right\}$ and that the 1st exceeds the 2d. The progression will be.

$$b + d,\ b,\ \frac{b^2 + bd}{b + 2d},\ \frac{b^2 + bd}{b + 3d},\ \frac{b^2 + bd}{b + 4d},\ \frac{b^2 + bd}{b + 5d},\ \&c.$$

Whence, if out of a rank of harmonic proportionals, there be taken any series of equidistant terms, that series will be harmonically proportional. And this kind of proportion has several other properties common with arithmetic and geometric proportions.

When three terms are so disposed, that the diff. of the 1st and 2d : diff. of the 2d and 3d :: 3d : 1st, they are said to be in a contra-harmonic proportion. Thus, 6, 5, 3, and 12, 10, 4, are contra-harmonics. For 6 − 5 : 5 − 3 :: 3 : 6; and 12 − 10 : 10 − 4 :: 4 : 12. Or, supposing b greater than n, if the 2d term be greater than the 1st:

Then $bn + n^2$, $b^2 + n^2$, $b^2 + bn$, are contra-harmonics, for $bn - b^2 : n^2 - bn :: b^2 + bn : bn + n^2$.

But if the 1ſt term exceeds the 2d, then, $b^2 + bn$, $b^2 + n^2$, $bn + n^2$, are contra-harmonics. For $bn^2 - n^2 : b^2 - bn :: bn + n^2 : b^2 + bn$.

PROPOSITION, *propoſitio*, in logic, part of an argument wherein ſome quality, either negative or poſitive, is attributed to a ſubject, or, according to Chauvinus, it is a complete conſiſtent ſentence, indicating or expreſſing ſomething either true or falſe, without ambiguity; as God is juſt.

While the comparing of our ideas is conſidered merely as the act of the mind, aſſembling them together, and joining or disjoining them according to the reſult of its perceptions, this operation is called judgment. See IDEA and JUDGMENT. But when theſe judgments are expreſſed in words, they then bear the name of propoſitions. Hence a propoſition is a ſentence expreſſing ſome judgment of the mind, whereby two or more ideas are affirmed to agree or diſagree: and as our judgments include at leaſt two ideas, one of which is affirmed or denied of the other; ſo a propoſition muſt have terms correſponding to theſe ideas. The idea of which we affirm or deny, and of courſe the term expreſſing that idea, is called the ſubject of the propoſition; and the idea affirmed or denied, as alſo the term anſwering to it, is called its predicate; thus in the propoſition, God is omnipotent, God is the ſubject, it being of him that we affirm omnipotence; and omnipotent is the predicate, becauſe we affirm the idea expreſſed by that word to belong to God. See the articles SUBJECT and PREDICATE.

But as in propoſitions ideas are either joined or disjoined, it is not enough to have terms expreſſing thoſe ideas, unleſs we have alſo ſome words to denote their agreement or diſagreement. Now that word which connects in this manner the ſubject and predicate of a propoſition, is called the copula; and if a negative particle be annexed, we thereby underſtand that the ideas are disjoined. The ſubſtantive verb is commonly made uſe of for the copula, as in the above-mentioned propoſition, "God is omnipotent;" where the word *is* expreſſes the copula, and ſignifies the agreement of the two ideas, God and omnipotence; but if we mean to ſeparate two ideas, then, beſides the ſubſtantive-verb, we muſt alſo uſe ſome particle of negation to expreſs this repugnance: the propoſition, "Man is not perfect," may ſerve as an example of this kind; where the notion of perfection being removed from the idea of man, the negative particle *not*, is inſerted after the copula, to ſignify the diſagreement between the ſubject and predicate. The ſchoolmen call the two terms, *viz.* the ſubject and predicate, the matter; and the copula, the form of a propoſition.

When the mind joins two ideas, the propoſition expreſſing this judgment is termed affirmative; as, "a ſtone is heavy:" and, on the contrary, when the mind ſeparates two or more ideas, the propoſition expreſſing this judgment is called negative; as, "God is not the author of evil."

Now as terms may be either ſingular, or common and univerſal; if the ſubject of a propoſition be a common term taken in all its extent, the propoſition is called univerſal; as, "every man is mortal." If the common term be taken in an indeterminate part of its extent, the propoſition is called particular; as, "ſome men are virtuous." If the ſubject of the propoſition be ſingular, the propoſition is called ſingular; as, "Ariſtotle is the prince of philoſophers." Thoſe propoſitions which have only one ſubject and one attribute, are called ſimple; thoſe that have ſeveral ſubjects, or attributes, are called compound. See TERM, SUBJECT, PREDICATE, &c.

A ſyllogiſm conſiſts of three propoſitions, *viz.* the major, minor, and concluſion; an enthymeme, of two. See the articles SYLLOGISM and ENTHYMEME.

The ſchoolmen make ſeveral other ſpecies and diviſions of propoſitions, as a propoſition de primo adjacente, where the ſubject and predicate are both included under the verb, as *veni, vidi, vici*: a propoſition de ſecundo adjacente, is where either the ſubject or predicate is included in the verb; as, "Peter writes, I read:" a propoſition de tertio adjacente, is where both the ſubject and predicate are expreſs, and ſtand diſtinct from the verb, as "the mind is a ſubſtance." This propoſition is the rule or ſtandard of all the others, ſo that whatever propoſition can be reduced thereto is legitimate; and what cannot, is not legitimate.

Propoſitions are again divided into three claſſes; the firſt, regarding the matter; the

the ſecond, the form; and the third, the thought: thoſe of the firſt claſs are ſubdivided into finite and infinite, direct and indirect, ſingle and manifold. Finite or definite propoſition, is that which declares ſomething determinate on a ſubject, as, "man is not a ſtone." Infinite or indefinite propoſition, is that where either one or both of the terms are infinite, or have a negative prefixed to them, as, *non-homo eſt albus, homo eſt non albus, non-homo eſt non-albus.* Direct propoſition is that wherein a higher or more general thing is predicated of a lower and more particular, as, "man "is an animal." Indirect propoſition, is that wherein an inferior is predicated of an higher, as "an animal is man." Single propoſition, is that either ſingly or by conjunction: it is ſingly ſuch when it affirms or denies one thing of one other thing, as "man is an animal:" by conjunction, when ſeveral propoſitions are joined and coupled together, thus, "the "ſun ſhines and it is day," are two propoſitions, which conjoined make this one, "if the ſun ſhines it is day."

Of ſuch conjunct propoſitions there are divers kinds, *viz.* hypothetical, disjunctive, copulative, &c. Hypothetical propoſition, is that which conſiſts of ſeveral ſimple ones affected with ſome conditional one, as "if the ſun be ſet it is "night." For the disjunctive, copulative, &c. ſee the articles DISJUNCTIVE, COPULATIVE, &c.

Compound propoſition, is that where one or both the terms excite ſeveral ideas in the mind, as "a man is body and ſoul, and both together." Manifold propoſition is that conſiſting of ſeveral ſubjects, as "Peter and Paul preached:" or of ſeveral predicates, as "Peter and "Paul preach and pray."

In reſpect of form, propoſitions are divided into affirmative and negative, true and falſe, pure and modal. Affirmative propoſition is that whoſe attribute is joined to the ſubject, "God is a ſpi- "rit." A negative propoſition is that whoſe attribute is ſeparated from the ſubject, as "man is not a ſtone." True propoſition is that which declares a thing to be what it really is; and a falſe propoſition is that, which ſignifies a thing to be what it is not. The truth of a propoſition therefore depends on the connecting of the ſubject with the attribute, which is done by that act of the mind called judgment. Propoſitions are ſaid to be pure when they imply or involve nothing beſides their matter and form. Modal propoſition is that which, beſides the pure matter and form, involves ſome mode or manner of diſpoſition. See the article MODE.

To modal propoſitions the philoſophers refer excluſive, exceptive, and reſtrictive propoſitions. See the article EXCLUSIVE, &c.

For complex propoſitions, &c. ſee the article COMPLEX, &c.

PROPOSITION, in mathematics, is either ſome truth advanced and ſhewn to be ſuch by demonſtration, or ſome operation propoſed and its ſolution ſhewn. If the propoſition be deduced from ſeveral theoretical definitions compared together, it is called a theorem; if from a praxis, or ſeries of operations, it is called a problem. See the articles THEOREM and PROBLEM.

PROPOSITION, in poetry, the firſt part of a poem wherein the author propoſes briefly, and in general, what he is to ſay in the body of his work. It ſhould comprehend only the matter of the poem, that is the action and the perſons that act. Horace preſcribes modeſty and ſimplicity in the propoſition, and would not have the poet promiſe too much, nor raiſe in the reader too great ideas of what he is going to relate.

PROPREFECT, *propræfectus*, among the Romans, the prefect's lieutenant, or an officer whom the prefect of the pretorium commiſſioned to do any part of his duty in his place. See the article PREFECT.

PROPRETOR, a Roman magiſtrate, who, having diſcharged the office of pretor at home, was ſent into a province to command there with his former pretorial authority. It was alſo an appellation given to thoſe who, without having been pretors at Rome, were ſent extraordinarily into the provinces to adminiſter juſtice with the authority of pretors.

PROPRIETATE, PROBANDA, in law, a writ directed to the ſheriff, to make enquiry into the property of goods deſtrained, when the defendant claims it on a replevin ſued; and if thereon it be found for the defendant, he can proceed no farther.

PROPRIETATIS ELIXIR, in pharmacy, an elixir, the preparation of which the London-diſpenſatory directs as follows: take of choice myrrh, of the beſt aloes, and of ſaffron, each three ounces: when they are powdered, pour upon them a quart

quart of rectified ſpirit of wine; digeſt them four days to an extraction of the tincture, which pour off: to the remainder pour on more ſpirit of wine; digeſt and pour off as before, and afterwards draw away ſome of the ſpirit by diſtillation: it is made acid by an addition of the ſpirit of ſulphur, any quantity at diſcretion. This may be given from ten to thirty drops to children, and to grown perſons from twenty to ſixty, or more. It is particularly good in pale wan complexions, and will itſelf frequently cure the green ſickneſs; but in hot, florid conſtitutions, it does not ſo well, eſpecially in thoſe ſubject to the gravel. It is accounted very good to deſtroy worms in children, if taken twice or thrice a day for two or three weeks together. See the article ELIXIR.

PROPRIETOR, or PROPRIETARY, he who has the property of any thing. See the article PROPERTY.

PROPRIETY, in grammar, is where the direct and immediate ſignification of a word agrees to the thing it is applied to; in which ſenſe, it is uſed in oppoſition to figurative, or remote ſignification.

PROQUESTOR, *proquæſtor*, the queſtor's lieutenant, or a perſon who diſcharged the office of queſtor in his ſtead. See the article QUESTOR.

PRO RATA, in commerce, a term ſometimes uſed by merchants for, in proportion; as each perſon muſt reap the profit or ſuſtain the loſs pro rata to his intereſt, that is, in proportion to his ſtock.

PRO RATA PORTIONIS, in law. See ONERANDA PRO RATA PORTIONIS.

PRORÆ os, in anatomy, the ſame with os occipitis. See OCCIPITIS OS.

PROROGANDA ASSISA. See ASSISA.

PROROGATION, *prorogatio*, the act of prolonging, adjourning, or putting off to another time. The difference between a prorogation and an adjournment of parliament is, that by prorogation the ſeſſion is ended, and ſuch bills as paſſed in either houſe, or both houſes, and had not the royal aſſent, muſt, at the next aſſembly, begin again; becauſe that every ſeſſion of parliament is in law a ſeveral parliament: whereas, if the parliament be only adjourned, there is no new ſeſſion, and conſequently all things continue in the ſame ſtate they were in before the adjournment. See the articles ADJOURNMENT and PARLIAMENT.

PROSCRIPTION, *proſcriptio*, a publication made in the name of the chief or leader of a party, whereby he promiſes a reward to any one who ſhall bring him the head of one of his enemies.

PROSE, *proſa*, the natural language of mankind, looſe and unconfined, by poetical meaſures, rhymes, &c. in which ſenſe it ſtands oppoſed to verſe. See the article VERSE.

PROSECUTION. To make men liable to criminal proſecutions by the law of England, it is required, that they have the uſe of reaſon, and that they be *ſui juris*. On the firſt account, the law indulges infants under the age of diſcretion, idiots, and lunatics, whatever the nature of the fact may be; and even againſt the perſon of the king, as it has been held of late; neither will it ſuffer one who becomes *non compos* after he has committed a capital offence, to be either arraigned or executed. See the articles LUNATIC, INFANT, and IDIOT.

PROSECUTOR, in law, he that purſues a cauſe in another's name.

PROSELYTE, a new convert to ſome religion or religious ſect. See CONVERT.

PROSERPINACA, in botany, a genus of the triandria-trigynia claſs of plants, the calyx of which is a perianthium divided into three ſegments, and placed on the germen; the leaves are erect, acuminated and permanent; there is no corolla, nor pericarpium; the ſeed is ſingle, oſſeous, oval, and ſhut up in the cup.

PROSODY, *proſodia*, that part of grammar which treats of the quantities and accents of ſyllables, and the manner of making verſes. See GRAMMAR, QUANTITY, ACCENT, and VERSE.

The engliſh proſody turns chiefly on two things, numbers, and rhyme.

PROSONOMASIA, προσονομασία, a figure in rhetoric, whereby alluſion is made to the likeneſs of a ſound in ſeveral names or words.

PROSOPOPOEIA, Προσωποποιία, a figure in rhetoric, whereby we raiſe qualities, or things inanimate, into perſons. This figure is divided into two parts: 1. when good and bad qualities, accidents, and things inanimate, are introduced as living and rational beings; as in the following verſes of Milton:

-------Now gentle gales,
Fanning their odoriferous wings, diſpenſe

 Native

Native perfumes; and whifper whence
they ftole
Thofe balmy fpoils.--------

The fecond part of this figure is when we give a voice to inanimate things, and make rocks, woods, rivers, buildings, *&c.* exprefs the paffions of rational creatures, as in the following lines of Spencer.

She foul blafphemous fpeeches forth did
caft,
And bitter curfes, horrible to tell,
That ev'n the temple wherein fhe was
plac'd,
Did quake to hear, and nigh afunder
burft!

PROSTATÆ, in anatomy, a gland, generally fuppofed to be two feparate bodies, though in reality but one, of a roundifh, or fomewhat heart-fafhioned fhape, fituated juft before the neck of the bladder, and furrounding the beginning of the urethra. The fize of this body is about that of a walnut: it has two prominences, of a round figure in its hinder part, called prominentiæ natiformes: its eminence, called the caput gallinaginis, is in the urethra, and has two orifices, which are common to the veficulæ feminales and the ejaculatory ducts; and frequently there is a little finus between thefe. The fubftance of the proftatæ is glandulous and cavernous; it is very robuft, and furrounded with a ftrong membrane; the foraminula, or excretory ducts of this gland, difcharge from the little cells within it, a thin white fluid. In the human body there are ten or twelve of them; in dogs they are more numerous. The veffels of the proftatæ are common with the vaficulæ feminales.

The ufe of the proftatæ is to fecrete a fluid which, becaufe it is ejected in coition, fome have imagined to be of ufe in generation: but according to Heifter, it feems only deftined to lubricate the urethra, and be a kind of vehicle to the femen, which is too thick otherwife to pafs with the neceffary eafe.

PROSTHAPHÆRESIS, προσθαφαίρησις, in aftronomy, the difference between the true and mean motion, or true and mean place, of a planet, called alfo equation of the orbit, or of the center, and fimply equation.

Profthaphærefis amounts to the difference between the mean and equated anomaly. Suppofe the circle A L M P N R (plate CCXIII. fig. 1.) the orbit of the earth furrounded by the ecliptic ♈ ♋ ♎, *&c.* and fuppofe S the fun, and the earth in R, the mean anomaly will be the arch A P R, or, cafting away the femicircle, the arch R P or the angle P C R; and the true anomaly, rejecting the femicircle, will be P S R, which is equal to P C R + C R S. If then to the mean anomaly we add the angle C R S, we fhall have the true anomaly P S R, and the earth's place in the ecliptic. And here the angle C L S, or C R S, is called the profthaphærefis; by reafon that it is fometimes to be added and fometimes fubtracted from the mean motion, that we may have the true motion, or place of the earth.

PROSTHESIS, in grammar, the prefixing fome letter or fyllable at the beginning of a word, as in *gnatus*, for *natus*, *&c.*

PROSTHESIS, among furgeons, is the fupplying that which is deficient by the appofition of new matter, as the filing up ulcers, wounds, *&c.* with new flefh.

PROSTYLE, in antient architecture, a range of columns in the front of a temple.

PROSYLLOGISM, in the fchools, fometimes denotes an argument produced to confirm one of the premiffes of a fyllogifm. Others define it an argument compofed of two fyllogifms, fo difpofed as that the conclufion of the former is the major or minor of the latter; fo that the fecond fyllogifm may be omitted or underftood. See the article SYLLOGISM.

PROTASIS, in the antient drama, the firft part of a comic or tragic piece, wherein the feveral perfons are fhewn, their characters intimated, and the fubject of the piece propofed and entered upon. See the article DRAMA.

It might reach as far as our two firft acts, and where it ended the epitafis commenced. See the article EPITASIS.

PROTATICUS, in the antient drama, a perfon who never appeared but in the protafis, or firft part of the play.

PROTEA, *narrow-leaved* SILVER-TREE, in botany, a genus of the tetrandria-monogynia clafs of plants, with a uniform compound flower, the peculiar corollæ of which are monopetalous, and divided into four fegments at the limb: the feeds are contained in the cup, *viz.* a fingle feed fucceeding each peculiar corolla.

PROTECTION, the fhelter, defence, authority, and aid employed by any one in behalf of another.

Protection, in law, in its general fenfe, denotes

denotes the ſafety every ſubject, denizen, and alien enjoys from the laws; and in a more ſpecial ſenſe, it is uſed for an exemption or immunity given by the king to a perſon for a time, to ſecure him againſt ſuits at law, or other vexations.

Protection is alſo uſed for a privilege belonging to embaſſadors, members of parliament, *&c.* whereby they and their ſervants are ſecured from arreſts, *&c.*

PROTECTOR, a perſon who undertakes to ſhelter and defend the weak, helpleſs and diſtreſſed.

Every catholic nation and every religious order, has a protector reſiding at the court of Rome, who is a cardinal, and is called the cardinal protector.

Protector is alſo ſometimes uſed for a regent of a kingdom, made choice of to govern it during the minority of a prince.

Cromwell aſſumed the title and quality of lord protector of the commonwealth of England, *&c.*

PROTEST, in law, is a call of witneſs, or an open affirmation that a perſon does, either not at all, or but conditionally, yield his conſent to any act, or to the preceeding of any judge in a court in which his juriſdiction is doubtful; or to anſwer upon his oath farther than he is bound by law.

Any of the lords in parliament have a right to proteſt their diſſent to any bill paſſed by a majority: which proteſt is entered in form. This is ſaid to be a very antient privilege. The commons have no right to proteſt.

Protest, in commerce, is a ſummons wrote by a notary public to a merchant, banker, or the like, to accept or diſcharge a bill of exchange drawn on him, after his having refuſed either to accept or pay it.

There are two kinds of proteſts, the one for want of accepting the bill at the time of preſenting it; the other for want of payment when it becomes due, whether it has been accepted or not.

The bearers of bills of exchange that have been accepted, or which become payable at a certain day, are obliged to have them either payed or proteſted within three days after they become due, and this proteſt is to be notified, within fourteen days after to the party from whom the bill was received, who, upon ſuch proteſt being produced, is to repay the ſaid bill with intereſt and charges from the time of the proteſting; and in default of ſuch proteſt, or due notice within the days limited, the perſon ſo failing ſhall be liable to all coſts, damages, and intereſt.

PROTESTANT, a name firſt given in Germany to thoſe who adhered to the doctrine of Luther; becauſe in 1529, they proteſted againſt a decree of the emperor Charles V. and the diet of Spires; declaring that they appealed to a general council. The ſame name has alſo been given to thoſe of the ſentiments of Calvin, and is now become a common denomination for all thoſe of the reformed churches. See the articles Lutherans and Calvinists.

PROTESTATION, a ſolemn declaration made by ſome judiciary act or proceeding againſt any oppreſſion, violence or injuſtice; or againſt the legality of a ſentence, decree, or other procedure; importing that the party is determined to oppoſe it at the proper time. See the article Protest.

PROTHONOTARY, a term which properly ſignifies firſt notary, and which was antiently the title of the principal notaries of the emperors of Conſtantinople.

Prothonotary with us is uſed for an officer in the courts of king's bench and common pleas; the former of which courts has one, and the latter three. The prothonotary of the king's bench records all civil actions ſued in that court, as the clerk of the crown-office does all criminal cauſes. The prothonotaries of the common pleas enter and inrol all declarations, pleadings, aſſizes, judgments and actions: they alſo make out all judicial writs, except writs of habeas-corpus, and diſtringas jurator, for which there is a particular office, called the habeas corpora office; they likewiſe enter recognizances acknowledged, and all common recoveries; make exemplifications of records, *&c.*

In the court of Rome, there is a college of twelve prelates, called apoſtolical prothonotaries, empowered to receive the laſt wills of cardinals, to make all informations and proceedings neceſſary for the canonization of ſaints, and all ſuch acts as are of great conſequence to the papacy: for which purpoſe they have the right of admiſſion into all conſiſtories, whether public or half public. They alſo attend on the pope, whenever he performs any extraordinary ceremony out of Rome.

PROTHYRIS, in the antient architecture, is

is sometimes used for a quoin or stone in the corner of a wall, and sometimes for a cross beam or rafter. Prothyris is also used by Vignola for a particular sort of key of an arch, an instance of which is found in the ionic order: it consists of a roll of water-leaves between two reglets and two fillets, crowned with a doric cymatium; its figure greatly resembling that of modillion.

PROTHYRUM, in architecture, a porch at the outer door of a house.

PROTO, πρωτος, a greek term, frequently used in composition of priority: thus, proto-collum, in the antient jurisprudence, signifies the first leaf of a book; proto-martyr, the first martyr; proto-plast, the first man formed, &c.

PROTONOTARY, or PROTHONOTARY. See the article PROTHONOTARY.

PROTO-TYPE, is the original or model after which a thing was formed; but chiefly used for the patterns of things to be engraved, cast, &c.

PROTOTYPHON, in grammar, sometimes denotes a primitive word. See the article PRIMITIVE.

PROTRACTION, in surveying, the same with plotting. See the article PLOTTING and PROTRACTOR.

PROTRACTOR, in surgery, a kind of forceps, so called from extracting foreign bodies out of wounds. See WOUND, FORCEPS, and EXTRACTION.

PROTRACTOR is also the name of an instrument used for protracting or laying down on paper the angles of a field, or other figure. See PLOTTING.

The protractor is a small semi-circle (plate CCXIV. fig. 1. n°. 1) of brass, or other solid matter; the limb or circircumference of which is nicely divided into 180 degrees: it serves not only to draw angles on paper, or any plane, but also to examine the extent of those already laid down. For this last purpose, let the small point, A, in the center of the protractor, be placed above the angular point, and let the side AB coincide with one of the sides that contain the angle proposed; then the number of degrees cut off by the other side, computing on the protractor from B, will shew the quantity of the angle that was to be measured.

But when any angle is to be made of a given quantity, suppose 40°, on a given line A B (*ibid.* n° 2.) and at a given point of that line A; upon this point apply the center A of the protractor, in such a manner, that the side A B of the protractor may coincide with the given line A B; then let a dot or mark be made at the given number of degrees on the limb, *viz.* 40°, at C, and a right line drawn from C to A, will form an angle C A B = 40°, as is manifest.

This is the most natural and easy method either of examining the extent or quantity of an angle, or for describing an angle of any quantity required. But when a protractor is wanting, the same may be done by means of a line of chords: thus to lay down the foresaid angle C A B (*ibid.* n° 2.) by a line of chords, take 60° of the said line in your compasses, and from the center A describe an arch D E, which you imagine will be more than 40°; then taking the given number of degrees, *viz.* 40°, in your compasses, from the line of chords, and setting one foot in D, the point where A B produced intersects the arch D E, make a small sweep cutting the former arch in E; and, lastly, join the points A and E either wholly or in part as far as C, and the angle E A B or C A B = 40°, as is manifest.

When an obtuse angle is required to be laid down or measured, let its complement to a semi-circle be measured, and thence the obtuse angle will be found, and may be laid down as directed above. There is commonly annexed to this instrument, a fine needle fitted into a handle, and called a protracting-pin; the use of which is to prick off degrees and minutes from the limb of the protractor.

PROTUBERANCE, in anatomy, is any eminence whatever natural or preternatural, that projects or advances out beyond the rest.

PROVEDITOR, an officer in several parts of Italy, particularly at Venice, who has the direction of matters relating to policy. At Venice there is also a proveditor general of the sea, who pays the seamen and soldiers, and whose authority extends over the whole fleet when the captain-general is absent. The captain-general and proveditor are mutual spies upon one another; for though the proveditor be inferior to the general, yet is the power so divided, that the one has authority without strength, the other strength without authority.

PROVENCE, a province or government of France, bounded by Dauphine on the north;

north; by Piedmont on the eaft; by the Mediterranean on the fouth; and by the river Rhone, which feparates it from Languedoc, on the weft: it is about an hundred miles long, and near as many broad.

PROVEND, or PROVENDER, originally fignified a kind of veffel containing the meafure of corn daily given to a horfe, or other beaft of labour for his fubfiftence: but it is now ufed for all the food given to cattle.

PROVER, in law, the fame with probator. See the article PROBATOR.

PROVERB, according to Camden, is a concife, witty, and wife fpeech, grounded upon experience, and for the moft part containing fome ufeful inftruction.

Book of PROVERBS, a canonical book of the Old Teftament, containing a part of the proverbs of Solomon, the fon of David, king of Ifrael. The firft twenty-four chapters are acknowledged to be the genuine work of that prince; the next five chapters are a collection of feveral of his proverbs, made by order of king Hezekiah; and the two laft feem to have been added, though belonging to different and unknown authors, Agur the fon of Jakeh, and king Lemuel.

In this excellent book are contained rules for the conduct of all conditions of life; for kings, courtiers, mafters, fervants, fathers, mothers, children, *&c.*

PROVERBS *of Barthrouherri*, a facred book of the modern Indians. It is divided into three books, each containing ten chapters, and in each of thefe are ten fentences or proverbs. The firft book is entitled, *Of the way which leads to Heaven*; the fecond, *Of the conduct of a rational creature*; and the third, *Of love.*

PROVIDENCE, the conduct and direction of the feveral parts of the univerfe, by a fuperior intelligent being.

The notion of a providence is founded on this fuppofition, that the creator has not fo fixed and afcertained the laws of nature, nor fo connected the chain of fecond caufes, as to leave the world to itfelf; but that he ftill preferves the reins in his own hands, and occafionally interpofes, alters, enforces, reftrains, and fufpends thofe laws by a particular interpofition.

Some, with the epicureans, deny a providence, as imagining it inconfiftent with the happinefs of the divine nature. See the article EPICUREAN PHILOSOPHY. Others again deny the exiftence of a providence, on account of the feemingly unjuft diftribution of good and evil. See the articles GOOD and EVIL.

Simplicius argues thus for a providence: If God do not look to the affairs of the world, it is either becaufe he cannot or will not; but the firft is abfurd, fince to govern cannot be difficult, when to create was eafy; and the latter is both abfurd and blafphemous. See the article GOD.

The fentiments of Cicero are likewife very precife and pertinent to this purpofe: he thinks it impoffible for one who duely confiders the innumerable objects of the univerfe, and their invariable order and beauty, to entertain the leaft doubt, but that there is fome efficient caufe who prefides over and directs the mighty fabric! Nay he lays it down as a fundamental principle of all focieties, that there is a divine providence, which directs all events, obferves the actions of mankind, whether good or bad, difcerns the very intention of the heart, and will certainly make a difference between good men and the wicked.

Nuns of PROVIDENCE, a community of young women at Paris, who make two vows, *viz.* of chaftity and obedience. They are habited in black, and board young ladies who chufe to be educated among them.

PROVIDENCE-PLANTATION, a colony of New-England, which, with Rhode-ifland, conftitutes a charter-government; its chief town is Newport.

PROVIDENCE is alfo one of the Bahama-iflands, planted and fortified by the Englifh: weft long. 78°, north lat. 25°.

PROVINCE, *provincia*, in roman antiquity, a country of confiderable extent, which, upon being entirely reduced under the roman dominion, was new-modelled according to the pleafure of the conquerors, and fubjected to the command of annual governors fent from Rome; being commonly obliged to pay fuch taxes and contributions as the fenate thought fit to demand.

Thefe provinces got the appellations of confular or pretorian, according as they were governed by confuls or pretors. See the articles CONSUL and PRETOR.

PROVINCE, in geography, a divifion of a kingdom or ftate, comprifing feveral cities, towns, *&c.* all under the fame government, and ufually diftinguifhed by the extent either of the civil or ecclefiaftical jurifdiction.

The

The church diftinguifhes its provinces by archbifhoprics; in which fenfe, England is divided into two provinces, Canterbury and York. See the articles CANTERBURY and YORK.

The united provinces, are the feven northern provinces of the low countries, who, revolting from the fpanifh dominion, made a perpetual alliance, offenfive and defenfive, at Utrecht, anno 1579. See the article NETHERLANDS.

PROVINCIAL, *provincialis*, fomething relating to a province. See the preceding article.

It alfo denotes, in romifh countries, a perfon who has the direction of the feveral convents of a province.

PROVINE, a branch of a vine laid in the ground to take root and propagate. See the article VINE.

PROVINS, a city of Champaign, in France, forty-five miles fouth-eaft of Paris.

PROVISION, in the canon law, denotes the title or inftrument, by virtue whereof an incumbent holds a benefice, bifhopric, &c.

Provifions by prevention, called alfo *gratiæ expectativæ & mandata de providendo*; fee the article PREMUNIRE.

PROVISO, in law, a condition inferted in a deed, upon the obfervance whereof the validity of the deed depends.

Privifo, in judicial matters, is where the plaintiff defifts from profecuting an action, by bringing it to trial in due time; in which cafe, the defendant may take out a venire facias to the fheriff in thefe words, Provifo quod, &c. to the end that, if the plaintiff take out any writ to that purpofe, the fheriff fhall fummon but one jury upon them both. In which cafe it is called going to trial by provifo.

PROVISOR, in general, denotes one who hath the care of providing things neceffary, being the fame with purveyor.

PROVISOR, in our ftatutes, alfo denotes a perfon who fued to the court of Rome for a provifion or expectative grace. See the article PREMUNIRE.

PROVOCATIVE, in phyfic, a medicine which is fuppofed to ftrengthen nature, and incites to venery.

PROVOST, *præpofitus*, an officer, whereof there are divers kinds, civil, military, &c.

PROVOST of a city or town, is the chief municipal magiftrate in feveral trading cities, particularly Edinburgh, Paris, &c. being much the fame with mayor in other places.

He prefides in city courts, and, together, with the baillies, who are his deputies, determines in all differences that arife among citizens.

The provoft of Edinburgh, as well as all the other confiderable towns in Scotland, has the title of lord; and the former calls yearly conventions of the royal boroughs to Edinburgh by his miffives.

PROVOST, or PREVOT ROYAL, a fort of inferior judge eftablifhed throughout France, to take cognizance of all civil, perfonal, real, and mixed caufes, among the people only.

Grand PROVOST *of France*, or of the houfhold, has jurifdiction in the king's houfe, and over the officers therein; looks to the policy thereof, the regulation of provifions, &c.

Grand PROVOST *of the conftable*, a judge who manages proceffes againft the foldiers in the army who have committed any crime.

He has four lieutenants diftributed throughout the army, called provofts of the army, and, particularly, provofts in the feveral regiments.

PROVOST *marfhal of an army*, is an officer appointed to feize and fecure deferters, and all other criminals. He is to hinder foldiers from pillaging, to indict offenders, and fee the fentence paffed on them executed. He alfo regulates the weights and meafures, and the price of provifions, &c. in the army. For the difcharge of his office, he has a lieutenant, a clerk, and a troop of marfhal-men on horfeback, as alfo an executioner.

There is alfo a provoft marfhal in the navy, who hath charge over prifoners, &c.

The French have a provoft-general of the marines, who is to profecute the marines, when guilty of any crime, and make report thereof to the council of war; befides a marine provoft in every veffel, who is a kind of gaoler, and takes the prifoners into his care, and keeps the veffel clean.

PROVOSTS *of the marfhals*, are a kind of lieutenants of the marfhals of France; of thefe are an hundred and eighty feats in France; their chief jurifdiction regards highwaymen, footpads, houfebreakers, &c. See MARSHAL.

PROVOST *of the mint*, a particular judge inftituted for the apprehending and profecuting of falfe coiners.

PROVOST, or PREVOT, in the king's ſtables; his office is to attend at court, and hold the king's ſtirrup, when he mounts his horſe, *&c.* There are four provoſts of this kind, each of whom attends in his turn, monthly.

PROW, *prora,* in navigation, denotes the head or fore-part of a ſhip, particularly in a galley, being that which is oppoſite to the poop or ſtern. See SHIP.

In the middle of the prow is the beak that cuts the water, on the top of which is commonly ſome figure or hieroglyphic.

The prow is lower than the poop, and contains fewer decks.

PROXENETA, or PROXENETES, a kind of broker or agent, who tranſacts between two perſons.

It is chiefly applied to thoſe who negotiate marriages, *&c.*

The proxenetæ made a kind of college in Rome; and to them the fathers addreſſed themſelves to ſound the inclinations of the young men they intended for their daughters.

PROXIMITY, *proximitas,* denotes the relation of nearneſs, either in reſpect of place, blood, or alliance.

PROXY, *procurator,* a perſon who officiates as a deputy in the room of another.

Princes are uſually married by proxies, or repreſentatives; and every peer of Great Britain has the privilege of conſtituting a proxy, to vote for him in his abſence: yet ſuch a one muſt be entered in perſon, and ſometimes theſe proxies have been refuſed by the king.

The term proxy or procuracy, among civilians, alſo denotes a commiſſion given to a proctor by a client, impowering him to manage a cauſe in his ſtead. See the article PROCTOR.

And among canoniſts, proxies ſignify annual payments otherwiſe called procurations. See PROCURATION.

PRUCH, or BRUGG, a town of Auſtria, in Germany, twenty-two miles ſouth-eaſt of Vienna.

PRUCK, or BRUCH, of Stiria, in Germany, ſixty miles ſouth weſt of Vienna.

PRUINA, HOAR-FROST, in phyſiology. See the article FROST.

Sal PRUNELLÆ, in pharmacy, a preparation of purified ſaltpetre, called alſo cryſtal mineral, made in this manner: having melted any quantity of ſaltpetre, caſt a little flowers of ſulphur upon it, and when that is burnt throw on more; and continue to do ſo, till the nitre flow as clear as rock-water. Then with a clean iron or braſs-ladle take it out, and putting it into moulds till coagulated, preſerve it for uſe.

It is ſaid to be diuretic and cooling, and therefore often given in fevers: it is alſo very good in gonorrhæas, ſore throats, and inflammations of the tonſils; being gently melted in the mouth, and ſwallowed with a little fine ſugar.

Its doſe is from ſix grains to a dram.

PRUNES, in commerce, are plums dried in the ſunſhine, or in an oven. See the the article PLUM.

Prunes of Brunolia pay for each pound, on importation, a duty of $2\frac{32\frac{1}{2}}{100}$ d. and draw back, on exportation, $2\frac{4}{100}$ d.

PRUNIFEROUS TREES, thoſe with pretty large and fleſhy fruit, with a nucleus in the middle, and called by botaniſts a drupe. See the article DRUPE.

PRUNING, in gardening and agriculture is the lopping off the ſuperfluous branches, of trees, in order to make them bear better fruit, grow higher, or appear more regular.

Pruning, tho' an operation of very general uſe, is neverthleſs rightly underſtood by few; nor is it to be learned by rote, but requires a ſtrict obſervation of the different manners of growth of the ſeveral ſorts of fruit-trees; the proper method of doing which cannot be known without carefully obſerving how each kind is naturally diſpoſed to produce its fruit: for ſome do this on the ſame year's wood, as vines; others, for the moſt part, upon the former year's wood, as peaches, nectarines, *&c.* and others upon ſpurs which are produced upon wood of three, four, *&c.* to fifteen or twenty years old, as pears, plums, cherries, *&c.* therefore, in order to the right management of fruit trees, proviſion ſhould always be made to have a ſufficient quantity of bearing wood in every part of the trees, and at the ſame time there ſhould not be a ſuperfluity of uſeleſs branches, which would exhauſt the ſtrength of the trees, and cauſe them to decay in a few years.

The reaſons for pruning of fruit-trees; are, 1. To preſerve them longer in a vigorous bearing-ſtate; 2. To render them more beautiful; and, 3. To cauſe the fruit to be larger and better taſted.

The general inſtructions for pruning are as follows: the greateſt care ought to be taken of fruit-trees in the ſpring, when

they are in vigorous growth; which is the only proper feafon for procuring a quantity of good wood in the different parts of the tree, and for difplacing all ufelefs branches as foon as they are produced, in order that the vigour of the tree may be entirely diftributed to fuch branches only as are defigned to remain. For this reafon trees ought not to be neglected in April and May, when their fhoots are produced: however, thofe branches which are intended for bearing the fucceeding year fhould not be fhortened during the time of their growth, becaufe this would caufe them to produce two lateral fhoots from the eyes below the place where they were ftopped, which would draw much of the ftrength from the buds of the firft fhoot; and if thefe two lateral fhoots are not entirely cut away at the winter-pruning, they will prove injurious to the tree. This is to be chiefly underftood of ftone-fruit and grapes; but pears and apples, being much harder, fuffer not fo much, tho' it is a great difadvantage to thofe alfo to be thus managed. It muft likewife be remarked, that peaches, nectarines, apricots, cherries and plums are always in the greateft vigour when they are leaft maimed by the knife, for where large branches are taken off they are fubject to gum and decay; it is therefore the moft prudent method to rub off all ufelefs buds when they are firft produced, and to pinch others, where new fhoots are wanted to fupply the vacancies of the wall; by which management they may be fo ordered as to want but little of the knife in winter-pruning. The management of pears and apples is much the fame with thefe trees in fummer; but in winter they muft be very differently pruned: for as peaches and nectarines, for the moft part, produce their fruit upon the former year's wood, and muft therefore have their branches fhortened according to their ftrength, in order to produce new fhoots for the fucceeding year; fo, on the contrary, pears, apples, plumbs, and cherries, producing their fruit upon fpurs, which come out of the wood of five, fix, and feven years old, fhould not be fhortened, becaufe thereby thofe buds which were naturally difpofed to form thefe fpurs, would produce wood-branches; by which means the trees would be filled with wood, but would never produce much fruit. The branches of ftandard-trees fhould never be fhortened unlefs where they are very luxuriant, and by growing irregularly on one fide of the trees, attract the greateft part of the fap, by which means the other parts are either unfurnifhed with branches, or are rendered very weak; in which cafe the branch fhould be fhortened down as low as is neceffary, in order to obtain more branches to fill up the hollow of the tree; but this is only to be underftood of pears and apples, which will produce fhoots from wood of three, four, or more years old; whereas moft forts of ftone-fruit will gum and decay after fuch amputations: whenever this happens to ftone-fruit, it fhould be remedied by ftopping or pinching thofe fhoots in the fpring, before they have obtained too much vigour, which will caufe them to pufh out fide branches; but this muft be done with caution. You muft alfo cut out all dead or decaying branches, which caufe their heads to look ragged, and alfo attract noxious particles from the air: in doing of this, you fhould cut them clofe down to the place where they were produced, otherwife that part of the branch which is left will alfo decay, and prove equally hurtful to the reft of the tree; for it feldom happens when a branch begins to decay, that it does not die quite down to the place where it was produced, and if permitted to remain long uncut, often infects fome of the other parts of the tree. If the branches cut off are large, it will be very proper, after having fmoothed the cut part exactly even with a knife, chiffel, or hatchet, to put on a plafter of grafting clay, which will prevent the wet from foaking into the tree at the wounded part. All fuch branches as run a-crofs each other, and occafion a confufion in the head of the tree, fhould be cut off; and as there are frequently young vigorous fhoots on old trees, which rife from the old branches near the trunk, and grow upright into the head, thefe fhould be carefully cut out every year, left, by being permitted to grow, they fill the tree too full of wood. For pruning the roots and branches of trees in tranfplanting them, fee the article PLANTING.

As to the pruning of foreft-trees, if they be large, it is beft not to prune them at all; yet, if there be an abfolute neceffity, avoid taking off large boughs as much as poffible. And, 1. If the bough be fmall, cut it fmooth, clofe, and floping. 2. If the branch be large, and the tree old, cut it

it off at three or four feet from the ftem. 3. If the tree grow crooked, cut it off at the crook floping upward, and nurfe up one of the moft promifing fhoots for a new ftem. 4. If the tree grow top-heavy, its head muft be lightened, and that by thinning the boughs that grow out of the main branches. But if you would have them fpring, rub off the buds, and fhroud up the fide-fhoots. 5. If the fide-bough ftill break out, and the top be able to fuftain itfelf, give the boughs that put forth in fpring a pruning after Midfummer, cutting them clofe.

PRUNUS, the PLUM-TREE, in botany. See the article PLUM-TREE.

PRURITUS, or PRURIGO, among phyficians, denotes an itching fenfation. See the article ITCH.

PRUSSIA, a province of Poland, fituated on the coaft of the Baltic fea, and divided into regal and ducal Pruffia, the firft fubject to Poland, and the laft to the king of Pruffia.

PRUSSIAN BLUE, among painters, *&c.* an animal-colour, prepared thus: take of crude tartar and nitre, each four ounces; pulverize and mix them together, and by decrepitation, bring them to a fixed falt; which being powdered hot, add to it four ounces of thoroughly dried ox-blood, reduced to a fine powder: calcine the mixture in a clofe crucible, whereof it may fill two thirds: then lightly grind the matter in a mortar, and throw it hot into two quarts of boiling water; boil them together for half an hour, and afterwards, ftraining off the liquor, wafh the remaining black fubftance with frefh water, and ftrain as before, continuing to do this till the water poured off becomes infipid: put the feveral liquors together, and evaporate them to two quarts. Next, diffolve an ounce of green vitriol, firft calcined to whitenefs, in fix ounces of rain-water, and filtre the folution: diffolve alfo half a pound of crude alum in two quarts of boiling water; and add this to the folution of vitriol, taken hot from the fire, pouring to them likewife the firft lixivium, whilft thoroughly hot, in a large veffel; a great ebullition and a green colour will immediately enfue; whilft this ebullition continues, pour the mixture out of one veffel into another, and afterwards let it reft; then ftrain the liquor through a linen cloth, and let the matter or pigment remain in the ftrainer, from whence put it, with a wooden fpatula, into a fmall new pot; pour upon it two or three ounces of fpirit of falt, and a beautiful blue colour will immediately appear. Let the matter be now well ftirred, then fuffered to reft for a night; afterwards thoroughly edulcorate it by repeated affufions of rain-water, allowing a proper time for the precipitate to fubfide; and being drained in a linen-ftrainer, and gently dried, it at laft becomes the pigment called pruffian blue, of an exquifite colour. See the articles COLOUR, PAINTING, BLUE, *&c.*

PRYTANEUM, πρυτανεῖον, in grecian antiquity, a large building in Athens, where the council of the prytanes affembled, and where thofe, who had rendered any fignal fervice to the commonwealth, were maintained at the public expence. See the next article.

PRYTANES, πρυτάνεις, in grecian antiquity, were the prefidents of the fenate, whofe authority confifted chiefly in affembling the fenate; which, for the moft part, was done once every day.

The fenate confifted of five hundred, fifty fenators being elected out of each tribe; after which, lots were caft, to determine in what order the fenators of each tribe fhould prefide, which they did by turns, and during their prefidentfhip were called prytanes. However, all the fifty prytanes of the tribes did not govern all at once, but ten at a time, *viz.* for feven days; and after thirty-five days, another tribe came into play, and prefided for other five weeks; and fo of the reft.

PSADURIA, a clafs of coarfer ftones, of a laxer texture, not laminated, but fplitting with equal eafe in all directions. Of this clafs there are two genera, 1. Pfaduria, confifting of pure cryftal and fpar, without any admixture of heterogeneous particles, and containing feven different fpecies. 2. Impure pfaduria, confifting of fparry, cryftalline, and talcy particles, and containing fix different fpecies.

PSALM, ψαλμὸς, a divine fong or hymn; but chiefly appropriated to the hundred and fifty Pfalms of David, a cononical book of the Old Teftament.

Moft of the Pfalms have a particular title, fignifying either the name of the author, the perfon who was to fet it to mufic or fing it, the inftrument that was to be ufed, or the fubject and occafion of it. Some have imagined, that David was the fole author of the Book of Pfalms; but the titles of many of them prove the contrary, as Pfalm xix. which appears

to have been written by Mofes. Many of the Pfalms are infcribed with the names Korah, Jeduthun, &c. from the perfons who were to fing them. Pfalm lxxii. and cxxvii. are under the name of Solomon; the former being compofed by David for the ufe of his fon, and the latter being probably compofed by Solomon himfelf. The authority and canonicalnefs of the Book of pfalms has always been acknowledged, both by jews and chriftians. However, nothing can be a greater argument of its obfcurity than the great number of commentaries upon them.

Sternhold, one of the grooms of the privy-chamber to kind Edward VI. fet about a tranflation of the Pfalms into englifh metre; but he only went through thirty-feven of them, the reft being foon after done by Hopkins and others. This tranflation was at firft difcountenanced by many of the clergy, who looked upon it as done in oppofition to the practice of chanting the Pfalms in cathedrals: and indeed, fays Broughton, the ufe of thefe finging Pfalms is rather connived at than allowed; fince no one could ever difcover any authority for it, either from the crown or convocation.

PSALMODY, ψαλμωδια, the art or act of finging pfalms. See the preceding article.

Pfalmody was always efteemed a confiderable part of devotion, and ufually performed in the ftanding pofture; and as to the manner of pronunciation, the plain fong was fometimes ufed, being a gentle inflection of the voice, not much different from reading, like the chant in our catherals: at other times more artificial compofitions were ufed, like our anthems.

As to the perfons concerned in finging, fometimes a fingle perfon fung alone; fometimes the whole affembly joined together, which was the moft antient and general practice. At other times the pfalms were fung alternately, the congregation dividing themfelves into two parts, and finging verfe about, in their turns. There was alfo a fourth way of finging, pretty common in the IVth century, which was, when a fingle perfon began the verfe, and the people joined with him in the clofe: this was often ufed for variety, in the fame fervice with alternate pfalmody.

The ufe of mufical inftruments, in the finging of pfalms, feems to be as antient as pfalmody itfelf; the firft pfalm we read of, being fung to the timbrel, *viz.* that of Mofes and Miriam, after the deliverance of the Ifraelites from Egypt; and afterwards, mufical inftruments were in conftant ufe in the temple of Jerufalem. When the ufe of organs was introduced into the chriftian church, is not certainly known; but we find about the year 660, that Conftantine Copronymus, emperor of Conftantinople, fent a prefent of an organ to Pepin king of France.

PSALTER, ψαλτηριον, the fame with the Book of Pfalms. See the article PSALM.

Among the religious, in the popifh countries, the term pfalter is alfo given to a large chapelet or rofary, confifting of an hundred and fifty beads, according to the number of pfalms in the pfalter.

PSALTERY, ψαλτηριον, a mufical inftrument, much in ufe among the antient Hebrews, who called it nebel.

We know little or nothing of the precife form of the antient pfaltery. That now in ufe is a flat inftrument, in form of a trapezium, or triangle truncated at top: it is ftrung with thirteen wire-chords, fet to unifon or octave, and mounted on two bridges, on the two fides: it is ftruck with a plectrum, or little iron-rod, and fometimes with a crooked ftick. Its cheft or body refembles that of a fpinet.

PSEUDO, from ψευδος, a greek term ufed in the compofition of many words, to denote falfe, or fpurious; as the pfeudo-acacia, or baftard-acacia; pfeudo-fumaria, or baftard-fumitory; pfeudo-ruta, or baftard-rue, &c. See the articles ROBINIA, FUMITORY, and RUE.

We alfo fay a pfeudo-apoftle, or falfe apoftle; a pfeudo-prophet, or falfe prophet, &c. See the articles APOSTLE, PROPHET, &c.

PSEUDO-DIPTERE, in antient architecture. See the article DIPTERE.

PSEUDONYMUS, ψευδωνυμος, among critics, an author who publifhes a book under a falfe or feigned name, as cryptonymus is given to him who publfhes one under a difguifed name, and anonymous to him who publifhes without any name at all.

PSEUDO-STELLA, any kind of meteor, newly appearing in the heavens, and refembling a ftar.

PSIDIUM, in botany, a genus of the icofandria-monogynia clafs of plants, the flower whereof confifts of five oval, concave, and patent petals; and its fruit is a very

a very large unilocular berry, containing a great number of very ſmall ſeeds.

PSILOTHRON, in medicine, the ſame with depilatory. See DEPILATORY.

PSITTACUS, the PARROT, in ornithology. See the article PARROT.

PSOAS, in anatomy, the name of two muſcles, diſtinguiſhed by the epithets magnus and parvus. The pſoas magnus is one of the flexor-muſcles of the thigh, and ariſes from the firſt, ſecond, third, and fourth vertebræ of the loins. The pſoas parvus is one of the flexor-muſcles of the loins, which ariſes by a ſlender tendon from the os pubis, where it is joined to the ilium; and is inſerted into the ſide of the upper vertebra of the loins; it is often wanting, and when found, its office is to aſſiſt the quadratus in elevating the oſſa innominata, eſpecially when we lie down.

PSORA, ψωρα, in medicine, the ſame with the itch. See the article ITCH.

PSORALIA, the ITCH TREE, in botany, a genus of the diadelphia-decandria claſs of plants, with a papilionaceous flower; and the fruit is a pod, of the length of the cup, and contains only one kidney-ſhaped ſeed.

PSOROPHTHALMIA, ψωροφθαλμια, a ſcurfy eruption of the eye-brows, attended with an itching of the part.

PSYCHOLOGY, ψυχολογια, that branch of anthropology which treats of the ſoul, its faculties, paſſions, &c. See SOUL, FACULTY, PASSIONS, &c.

PSYCHOMANCY, ψυχομαντεια, a kind of divination, performed by raiſing the ſouls of perſons deceaſed. See the article DIVINATION.

PSYCHROMETER, an inſtrument for meaſuring the degrees of coldneſs or heat in the air, and more uſually called thermometer. See THERMOMETER.

PSYLLIUM, FLEA-WORT, in botany, is comprehended by Linnæus among the plantains. See pl. CCVIII. fig. 4. and the article PLANTAIN.

The ſeeds of pſyllium are recommended in the dyſentery, and corroſion of the inteſtines. See the article DYSENTERY.

PTARMICA, in pharmacy, medicines proper to excite ſneezing, and otherwiſe called ſternutatories. See the article STERNUTATORY.

PTARMICA, SNEEZE-WORT, in botany, a genus of the ſyngeneſia-polygamia-ſuperflua claſs of plants, the compound flower whereof is radiated, and the peculiar hermaphrodite ones of a funnel-ſhape, with a patulous quinquifid limb; the ſtamina are five capillary very ſhort filaments; and the ſeeds, one of which ſucceeds each hermaphrodite flower, are contained in the cup. See plate CCVIII. fig. 5.

The leaves of this plant are ſometimes uſed in ſallad; and when dried, and reduced to powder, they make a good ſternutatory.

PTELEA, in botany, a genus of the tetrandria-monogynia claſs of plants, the flower whereof conſiſts of four lanceolated, plane, patent petals; and its fruit is a circular membrane, placed perpendicularly with a cavity in the middle, containing a ſingle ſeed.

PTERARIA, in the hiſtory of inſects, a name given to that ſeries of inſects, which have wings. See INSECT.

Of the inſects of this ſeries, ſome have only two wings, others have four; they are hence naturally arranged into the two orders of the diptera and the tetraptera. See DIPTERA and TETRAPTERA.

PTERIS, in botany, a genus of the cryptogamia-filicum claſs of plants, in which the fructifications are diſpoſed in form of a line, ſurrounding the edges of the lower ſide of the leaves.

This genus comprehends the female fern and the rough ſpleenwort.

PTEROPHORI, πτεροφοροι, in roman antiquity, the meſſengers, or couriers, who brought tidings of a declaration of war, or the like; ſo called from their carrying wings on the points of their pikes.

PTERYGIUM, in ſurgery, the ſame with pannus or unguis. See UNGUIS.

PTERYGOIDE, ſomething reſembling a wing; from a reſemblance to which, four apophyſes or proceſſes of the os ſphenoides have been called pterygoide. See the article SPHENOIDES.

PTERYGOIDÆUS, in anatomy, the name of two muſcles of the lower jaw, one internal and the other external. The internal pterygoidæus-muſcle has its origin in the cavity of the pterygoide proceſs, and its termination is in the interior and lower ſuperficies of the angle of the jaw. The external pterygoidæus ariſes from the exterior lamina of the ſame proceſs, and terminates a little above the inſertion of the other.

There are alſo ſeveral pairs of muſcles of the pharynx and uvula, as the pterygopharyngæus, and pterygo-ſtaphylinus, which have got their names from being connected by the ſame proceſs. The pterygo-ſtaphylinus ariſes from the upper part

part of the faid procefs, and defcending between its two lamellæ, turns back its tendon over the thin apophyfis of the interior lamella, as over a pulley, to the anterior part of the membrane of the palate, into which it is inferted, and ferves to draw the uvula downwards and forwards.

PTISAN, πτισανη, is properly barley decorticated, or deprived of its hulls, by beating in a mortar, as was the antient practice: though the cooling potion, obtained by boiling fuch barley in water, and afterwards fweetening the liquor with liquorice-root, is what at prefent goes by the name of ptifan; and to render it laxative, fome add a little fena, or other herbs of the fame intention.

PTOLEMAIC, or PTOLEMÆAN *fyftem of aftronomy*, is that invented by Claudius Ptolemæus, a celebrated aftronomer and mathematician of Pelufium, in Egypt, who lived in the beginning of the IId century of the chriftian æra.

This hypothefes fuppofes the earth immoveably fixed in the center, not of the world only, but alfo of the univerfe: and that the fun, the moon, the planets, and ftars all move about it, from eaft to weft, once in twenty-four hours, in the order following, *viz.* the moon next to the earth, then mercury, venus, the fun, mars, jupiter, faturn, the fixed ftars, the firft and fecond cryftalline heavens, and above all the fiction of their primum mobile. See plate CCXIV. fig. 2. See alfo MOON, *&c.*

This fyftem or hypothefis was firft invented, and adhered to, chiefly becaufe it feemed to correfpond with the fenfible appearances of the celeftial motions. They took it for granted, that the motions which thofe bodies appeared to have, were fuch as they truly and really performed: and not dreaming of any motion in the earth, nor being apprized of the diftinction of abfolute and relative or apparent motion, they could not make a proper judgment of fuch matters; but were under a neceffity of being mifled by their fenfes, for want of the affiftances we now enjoy.

It is eafy to obferve, they had no notion of any other fyftem but our own, nor of any other world but the earth on which we live. They imagined that all the fixed ftars were contained in one concave fphere, and that the primum mobile was circumfcribed by the empyreal heaven, of a cubic form, which they fuppofed to be heaven, or the blifsful abode of departed fouls.

It would fcarce have been worth while to have faid fo much about fo abfurd an hypothefis, as this is now well known to be, were it not that there are ftill numerous retainers thereto, who endeavour very zealoufly to defend the fame, and that for two reafons principally, *viz.* becaufe the earth is apparently fixed in the center of the world, and the fun and ftars feem to move about it daily; and alfo becaufe the fcripture afferts the ftability of the earth, the motion of the fun, *&c.* But that the diurnal motion of the earth occafions all thefe appearances, we have abundantly proved under the articles DIURNAL and COPERNICAN.

And as to the argument drawn from fcripture, as it was never intended for an inftitution of aftronomy and philofophy, fo nothing in it is to be underftood as ftrictly or pofitively afferted in relation thereto; but only as fpoken agreeably to the common phrafe, or vulgar notion of things: and thus Sir Ifaac Newton himfelf would always fay, the fun rifes, fets, *&c.* though he well knew it was juft the reverfe in fact; fince there are divers phænomena of the heavenly bodies altogether inconfiftent with, and, in fome things, exactly contradictory to fuch an hypothefis, as has been fhewn by the arguments adduced to prove the truth of the copernican fyftem. See COPERNICAN.

PTYALISM, πτυαλισμος, in medicine, a falivation, or frequent and copious difcharge of faliva. See SALIVATION.

PUBERTY, *pubertas*, among civilians, *&c.* the age wherein a perfon is capable of procreation, or begetting children.

Boys arrive at puberty at fourteen years of age, and girls at twelve: eighteen years of age is accounted full puberty.

The natural ftate of mankind, after puberty, fays M. Buffon, is that of marriage, wherein they may make ufe of the new faculties they have obtained, by arriving at puberty; a ftate which will become painful, and may even fometimes be fatal, if celibacy be obftinately perfifted in. The too long continuance of the feminal liquor in the veffels, formed to contain it, may produce diforders in either fex, or at leaft irritations fo violent, that the united force of reafon and religion will fcarcely be fufficient to enable him to refift thofe impetuous paffions, which render man like the beafts, who are furious and head-ftrong, when

PULLIES.

No. 1. E B C A D W P

No. 2.

No. 3.

No. 4. A B H D C E G F P W

No. 5. P W

No. 6. P W

No. 8. A D B C P W

No. 9. A B C D E W P

No. 10. P W

No. 7. W P

they feel the force of these impressions. The extreme effect of this irritation in women is what physicians call the furor uterinus; but the mere force of nature alone seldom produces those fatal passions that spring from this disorder. See the article FUROR UTERINUS.

An opposite constitution of body is infinitely more common amongst women; the greatest part of them are naturally cold, or more or less tranquil under this passion: there are also men who continue chaste without the least difficulty; and he observes, that he has known some, who have enjoyed a good state of health, and have arrived to a considerable age, without being prompted by nature to gratify this passion in any manner whatsoever.

PUBES, among anatomists, *&c.* denotes the middle part of the hypogastric region of the abdomen, lying between the two inguina or groins. See ABDOMEN.

In adults, the pubes is more or less protuberant, and covered with hair; the appearance of which is the first sign of puberty. See the preceding article.

The pubes is that part of the abdomen which surrounds, in a great measure, the parts of generation. See the article GENERATION.

The os pubis is one of the three ossa innominata. See INNOMINATA.

The foramen of this bone is remarkable, as being the largest of all the foramina of the bones; it makes room for the passage of two muscles of the thigh, and the crural arteries and veins. In women, the os pubis is much smaller, and placed at a greater distance from the other bones than in men; and the angle between it and the ischium, is also larger in proportion in females: a circumstance very favourable not only to the gestation of the fœtus, but likewise to its exclusion. See the articles FOETUS and DELIVERY.

PUBLICAN, *publicanus*, among the Romans, one who farmed the taxes and public revenues.

PUBLICATION, *publicatio*, the act of making a thing known to the world; the same with promulgation.

By the canons, publication is to be made of the banns of matrimony, three times before the ceremony can be solemnized, without special licence to the contrary.

PUCELLAGE, *pucellagium*, or *puellagium*, denotes the state of virginity. See the article VIRGINITY.

PUCERON, *podura*, in zoology, a genus of wingless insects, with fewer than six pair of legs. The body is short and roundish; the tail is crooked and forked; the legs are three pairs, and serve only for walking; and the eyes are two, but each composed of eight lesser ones.

The pucerons are extremely numerous, living on the young branches of trees and plants; and often found in such clusters, as wholly to cover them: they are usually denominated from the trees and places where they are found; there being scarce a vegetable, either in the fields or gardens, that has not a peculiar species of puceron to feed on its juices.

PUDENDA, the parts of generation in both sexes. See GENERATION.

PUERILITY, in discourse, is defined by Longinus, to be a thought, which, by being too far-fetched, becomes flat and insipid. Puerility, he adds, is the common fault of those who affect to say nothing but what is brilliant and extraordinary.

PUGIL, *pugillus*, in physic, *&c.* such a quantity of flowers, seeds, or the like, as may be taken up between the thumb and two fore-fingers.

It is esteemed to be the eighth part of the manipule or handful.

PUISNE, or PUNY, in law, one younger born. It is not only applied to the second, third, fourth, *&c.* child, with regard to the first-born; but to the third, with regard to the second, *&c.* The last of all is called cadet.

It is also applied to a judge, or counsellor, who is in some respect inferior to another.

PULEX, the FLEA, in zoology. See the article FLEA.

PULLEY, *trochlea*, in mechanics, one of the mechanical powers, called by seamen a tackle. See TACKLE and POWER.

When a little wheel, commonly called a sheave, or sheever, is so fixed in a box or block, as to be moveable round a center-pin, passing thro' it, such an instrument is called a pulley. See plate CCXV. n° 3. And sometimes, though improperly, a box or block with several sheevers in it, is also called a pulley, as that represented *ibid*, n° 2. The first of these is, by workmen, called a snatch-block.

A rope going round one or more pullies, in order to raise a weight, is called the running-rope; and when a block and its sheevers is so fixed, that whilst it remains im-

immoveable, another block and sheevers rises, with the weight hanging at it, such a machine is called a pair of blocks.

If ADBE (*ibid.* n° 1.) be a pulley, upon which hang the weights P, W; then, since the nearest distances of the strings AP, and BW, from the center of motion C, are AC and BC, the pulley will be reduced to the lever or ballance, AB, with respect to its power; and from thence it appears, that since AC = BC, we shall always have P=W, for an equilibrum; and, therefore, no advantage in raising a weight, *&c.* can be had from a single pulley. In a combination of two pullies, AB, and DFEG (*ibid.* n° 4.) the power is doubled; for the pulley DFEG is reducible to the lever ED, which must be considered as fixed in the point E, to the immovable string HE; and the power acting at D, is equal to P; and the weight W, is sustained from the center C, of the pulley; but P : W : : CE : DE; therefore, since DE=2CE, it is W = 2P, or P = ½ W.

From what has been said, we may deduce the following rule, to know the advantage to be gained by a pair of blocks, let their number of pulleys and sheevers be what they will, *viz.* as 1 is to the number of ropes, or of the parts of the rope, applied to the lower pulleys, so is the weight to the power. Thus, it is evident, that in n° 1. one pound sustains only a weight of one pound; in n° 4. 1 pound sustains a weight of 2 pounds; in n° 5. a weight of 5 pounds; and in n° 6, 7, and 8. 1 pound raises 4 and 6 pounds. However, it ought to be observed, that the above rule is only applicable where the lower pulleys rise altogether in one block, along with the weight; for when they act upon one another, and the weight is only fastened to the lowermost, the force of the power is doubled by each pulley: thus, in n° 10. a power equal to 1 pound, will sustain 16 pounds, by means of four pulleys; because 1×2×2×2×2=16. Again, in the combination of pulleys, represented in plate CCXIV. fig. 3. n° 1. if the power at A be 1, that at B is 3, and at D 27. And with the combination, *ibid.* n° 2. which consists of 20 sheevers, five on each pin, one man may raise a ton weight.

The force of the pulley may also be easily shewn by comparing the velocities of the power and weight; for it is evident, if the weight W (*ib.* n° 4.) be raised one inch, each string HE, DB, will be shortened one inch, and consequently the string AP will be lengthened two inches; and so P will pass through twice the space that W does, in the same time: consequently the tackle of pulley, in the form of n° 5. will increase the power five times; and that of fig. 7. and 8. will increase it six times.

In the disposition of pulley according to n° 10. it is plain, since each pulley has a fixed rope, it must be considered as a lever of the second sort, and so will double the power of the foregoing pulley; and so four pulleys will increase the power sixteen times.

Though the last-mentioned form be of the greatest force from the same number of pulleys; yet, if we consider the simplicity, force, and conveniency of the tackle of pulley altogether, none is superior to that of the form of n° 9. where the uppermost pulley is fixed, and each has a rope annexed to the weight; its power is therefore thus estimated: when the weight W, is raised one inch the rope AB will be lengthened as much; and so the pulley C will descend one inch, by which means the rope CD will be lengthened two inches, and one by the rising of the weight W; wherefore the pulley E, will descend three inches; and thus the rope EP, will be lengthened six inches by that means (*viz.* three on each side) also, the rising of the weight will cause it to lengthen one inch more, so that the power P, goes through seven inches, while the weight W, rises one: therefore, P : W : : 1 : 7. And thus you proceed for any other number.

PULMO, the LUNGS, in anatomy. See the article LUNGS.

PULMO MARINUS, or SEA-LUNGS, a name given by some naturalists to a species of medusa, which seems a mere lump of whitish semi-pellucid jelly. See the article MEDUSA.

It is found in great abundance, floating on the surface of the water, about Sheppey-island, in Kent.

PULMONARIA, SAGE OF JERUSALEM, in botany, a genus of the pentandria-monogynia class of plants, with a monopetalous flower divided into five obtuse and erecto-patent segments at the limb: there is no pericarpium, the seeds, which are four, being contained in the calyx unaltered. See plate CCVIII. fig. 6.

The leaves of sage of Jerusalem are accounted pectoral and cardiac, and therefore

fore good in all diforders of the lungs.

PULMONARY VESSELS, in anatomy, are arteries and veins, which carry the blood from the heart to the lungs, and back again from the lungs to the heart. See the article ARTERY, &c.

The pulmonary artery arifes from the right ventricle of the heart, and is diftributed only through the lungs, but with a vaft number of ramifications. See the article LUNGS.

The pulmonary vein arifes from the left ventricle of the heart, where it firft forms a finus, then is divided into four branches, and afterwards into innumerable ones, which are diftributed through the whole fubftance of the lungs.

PULMONARY CONSUMPTION. See the articles CONSUMPTION and PHTHISIS.

PULP, in pharmacy, the flefhy and fucculent part of fruits, extracted by infufion or boiling, and paffed through a fieve.

Some phyficians alfo ufe the term pulp for the fatteft, fulleft, and moft folid part of the flefh of animals. See FLESH.

PULPIT, *pulpitum*, an elevated place in a church, whence fermons are delivered: the french give the fame name to a reading defk.

Among the antient Romans, the term pulpitum fignified the ftage of a theatre; or, according to fome, an eminence on the ftage, for the mufic; or a fuggeftum whence declamations, &c. were fpoke.

PULSATILLA, the PASQUE-FLOWER, in botany, a genus of the polyandria-polygynia clafs of plants, the flower of which confifts of fix plane, erect, acuminated, and long petals; there is no pericarpium; the feeds, which are numerous, compreffed, and hairy, being difpofed on an oblong, capitated, and hairy receptacle. See plate CCXI. fig. 3.

PULSE, *pulfus*, in the animal œconomy, denotes the beating or throbbing of the heart and arteries. See the articles HEART and ARTERY.

No doctrine has been involved in more difficulties than that of pulfes; fince, in giving a phyfiological account of them, phyficians have efpoufed quite oppofite fentiments; whilft fome doubt whether the pulfe is owing to the fyftole or diaftole; as alfo, whether the motion of the heart, and arteries, 'tis one and the fame, for a moment of time. See the articles SYSTOLE and DIASTOLE.

With regard to motion, the pulfes are reckoned only four, great and little, quick and flow. When quicknefs and greatnefs are joined together, it becomes violent; and when it is little and flow, it is called a weak pulfe. They are alfo faid to be frequent and rare, equal and unequal; but thefe are not the effential affections of motion. Frequency and quicknefs are often confounded with each other. A pulfe is faid to be hard or foft, with regard to the artery, according as it is tenfe, renitent, and hard, or flaccid, foft, and lax; for the difpofition of the arteries contribute greatly to the change of the pulfe; wherefore it fometimes happens, that the pulfe in both arms is not alike, which is very common in a hemiplexy. Add to thefe a convulfive pulfe, which does not proceed from the blood, but from the ftate of the artery, and is known by a tremulous fubfultory motion, and the artery feems to be drawn upwards: this in acute fevers, is the fign of death; and is faid to be the pulfe in dying perfons, which is likewife generally unequal and intermitting.—A great pulfe fhews a more copious afflux of the blood to the heart, and from thence into the arteries; a little pulfe, the contrary. See the article CIRCULATION.

The pulfes of perfons differ according to the largenefs of the heart and veffels, the quantity and temperies of the blood, the elaftic force of the canals; as alfo with regard to the fex, age, feafon, air, motion, food, fleep, watchings, and paffions of the mind. The pulfe is larger and more quick in men than in women; in the bilious and fanguineo-bilious, than in the phlegmatic and melancholic. Thofe who are lean, with tenfe fibres, and larger veffels, have a greater and a ftronger pulfe, than thofe that are obefe, with lax fibres and fmall veffels; whence they are more healthy, robuft, and apt for labour. In children, the pulfe is quick and foft; in adults, greater and more violent. In the old, it is commonly great, hard, and flow. Labour, motion, and exercife of the body increafe the circulation of the blood, the excretions, and particularly refpiration; reft renders the circulation flow and weak; intenfe fpeaking increafes the circulation, and confequently renders the pulfe large and quick. In watching, the pulfe is more evident; in fleep, more flow and languid. After drinking hot things, fuch as coffee and tea, or hot bath-waters, as well as after meals, the pulfe vibrates more quick. But nothing produces a greater change in the pulfe than affections of the mind; in terror it is

is unequal, ſmall, and contracted; in joy, frequent and great; in anger, quick and hard; in ſadneſs, ſlow, ſmall, deep, and weak; and in intenſe ſtudy, languid and weak. With regard to the air, when after the predominancy of a weſt or ſouth-wind, it becomes north or eaſt, the pulſe is ſtronger and larger; as alſo when the quickſilver riſes in the barometer. But when the atmoſphere is denſe, humid, rainy, with a long ſouth-wind; as alſo where the life is ſedentary, the ſleep long, and the ſeaſon autumnal, the pulſe is languid and ſmall, and the perſpiration decreaſed. In May it is great, and ſometimes violent; in the middle of ſummer, quick but weak; in the autumn, ſlow, ſoft, and weak; in the winter hard and great. A draſtic purge and an emetic render the pulſe hard, quick, and weak, with loſs of ſtrength; chalybeates, and the bark render it great and robuſt, and the complexion lively; volatiles amplify and increaſe the pulſe; acids and nitrous remedies refrigerate the body, and appeaſe the pulſe; opiates and the like, render it ſmall and weak, and decreaſe the elaſticity of the ſolids; whereas things abounding with a friendly ſulphur increaſe the pulſe; but poiſons render it ſmall, contracted, and hard. When the quantity of the blood is too great, bleeding raiſes the pulſe.

The ſeveral indications of the pulſe in different diſorders, may be ſeen under the reſpective names of theſe diſeaſes.

PULSE is alſo uſed for the ſtroke with which any medium is affected by the motion of light, ſound, *&c.* through it. See the articles MEDIUM, LIGHT, *&c.*

Sir Iſaac Newton demonſtrates, that the velocities of the pulſes in an elaſtic fluid medium (whoſe elaſticity is proportionable to its denſity) are in a ratio compounded of half the ratio of the elaſtic force directly, and half the ratio of the denſity inverſely; ſo that in a medium whoſe elaſticity is equal to its denſity, all pulſes will be equally ſwift.

PULSE, *legumen*, in botany, a term applied to all thoſe grains or ſeeds which are gathered with the hand, in contradiſtinction to corn, *&c.* which are reaped, or mowed: or it is the ſeed of the leguminous kind of plants, as beans, vetches, *&c.* but it is by ſome uſed for artichokes, aſparagus, *&c.*

PULSION, the act of driving, or impelling a thing forwards.

PULTOWAY, or POELTWA, a town of Ruſſia, in the province of Ukrain, ſituated in eaſt long. 35°, north lat. 50°.

PULVERIZATION, *pulverizatio*, the art of pulverizing, or reducing a dry body into a fine powder; which is performed in friable bodies, by pounding or beating them in a mortar, *&c.* but to pulverize malleable ones, other methods muſt be taken. To pulverize lead, or tin, the method is this: rub a round wooden-box all over the inſide, with chalk; pour a little of the melted metal nimbly into the box; when, ſhutting the lid, and ſhaking the box briſkly, the metal will be reduced to powder. See the article GRANULATION.

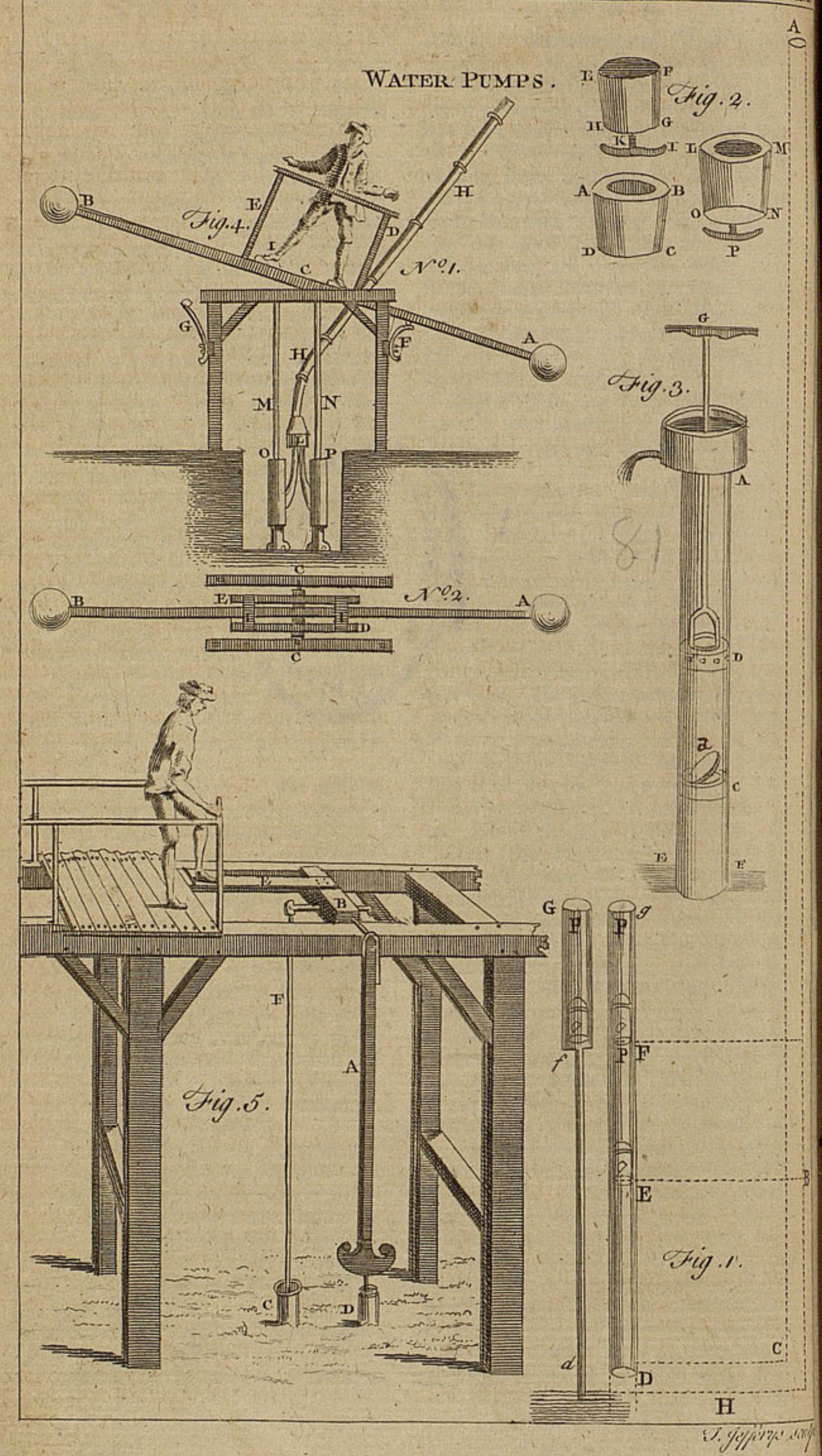
PULVINATED, in the antient architecture, a term applied to a frieze which ſwells or bulges out in the manner of a pillow.

PULVIS, a POWDER. See POWDER.

The operation of reducing medicines into powder is ſo very ſimple in itſelf, that it requires no other ſkill than having thoſe things which come under its management ſufficiently dry, in order to be ſo divided. In judging of the fitneſs of materials for this treatment, only theſe two conſiderations neceſſarily require our attention. The firſt is, whether the things themſelves are thus reducible without any previous management that may hurt their medicinal virtues? and next, whether their virtues are conveniently preſerved in this form, when reduced into it? Under the firſt of theſe it naturally occurs, that viſcid and oily ſubſtances cannot be thus managed without firſt reducing them to ſome brittleneſs, which cannot be done without drying: if ſuch things, therefore, cannot be ſufficiently dried for triture, without exhaling their better parts, or deſtroying that particular quality for which the ſimple is valued in medicine, as it happens with many ſeeds and gums, they are much better in any other form than this. The other requiſite in this form, relating to the preſervation of things reduced into it, directs not to preſcribe materials therein which are volatile, or will any other way change in the open air. The preparations, intentions, *&c.* of the ſeveral powders uſed in medicine, may be ſeen under their ſeveral heads. See the article POWDER.

PULVIS FULMINANS, among chemiſts, a powder ſo called from its ſmart and loud exploſion, when it begins to melt after being placed upon an iron-plate over a gentle fire. It is prepared thus: take three


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SEVILLA


Water Pumps.
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
No. 1.
No. 2.
T. Jefferys sculp.

three ounces of purified nitre, two ounces of falt of tartar, and one ounce of brimftone, and grind them well together in a mortar; then putting a fmall quantity, as about half a dram, over the fire, in the manner already mentioned, it will make a great explofion. The more philofophical way of accounting for this effect of the pulvis fulminans is, according to Dr. Shaw, by fuppofing that the acid fpirits of the nitre and fulphur being loofened by the heat, rufh towards one another, and towards the falt of the tartar with fo great a violence, as by the fhock at once to turn the whole into vapour and fmoke.

PUMICE, in natural hiftory, a flag or cinder of fome foffil, originally bearing another form, and only reduced to this ftate by the action of the fire, though generally ranked by authors among the native ftones. It is a lax and fpungy matter, frequently of an obfcure, ftriated texture in many parts, and always very cavernous and full of holes; it is hard and harfh to the touch, but much lighter than any other body that comes under the clafs of ftones. It is found in maffes of different fizes, and of a perfectly irregular fhape, from the bignefs of a pigeon's egg to that of a bufhel. We have it from many parts of the world, but particularly from about the burning mountains Ætna, Vefuvius, and Hecla, by whofe eruptions it is thrown up in vaft abundance; and being by its lightnefs fupported in the air, is carried into feas at fome diftance by the winds, and thence to diftant fhores. The great ufe of the pumice among the antients, feems to have been as a dentifrice, and at prefent it is retained in the fhops on the fame account.

Pumice-ftones, on being imported, pay a duty of 2 s. $6\frac{80}{100}$d. the ton; and draw back, on exportation, 2 s. 3 d.

PUMMEL. See the article POMMEL.

PUMP, *antlia*, in hydraulics, a machine formed on the model of a fyringe, for raifing of water. See SYRINGE.

The theory of pump-work depends, in a great meafure, upon the properties of the inverted fyphon; thus let A B C D E F G (plate CCXVI. fig. 1.) reprefent an inverted fyphon, A B C D a column of air, and D G the lower part of the pipe of a pump immerfed in the water of the well H I. Let P be the pifton of the pump at E in its loweft fituation, and at F in its higheft. Now as both thefe parts communicate with the water, one by preffing on it, the other by opening into it, they may be looked upon as communicating with one another. Wherefore A B C D, the column of air, would by its weight or preffure force up a column of water into the pipe D G to the height of thirty-two feet, were the air exhaufted from the faid pipe, and continued to that height; fince the weight of a column of air is equal to that of fuch a column of water of the fame bafe. If, therefore, the pifton P be thus thruft down to E, meeting the water there, and from thence it be raifed to F with an uniform motion, the water will rife from E to follow the pifton with a variable motion; the leaft of which is as $\sqrt{AC-DE}$, and the greateft as $\sqrt{AC-DE}=\sqrt{AB}$.

If in lifting up the pifton, the velocity of the water be lefs than that of the pifton, it will not be able to follow it; but will leave a fpace between them, which will increafe more and more as the velocity of the water becomes lefs than that of the pifton. The confequence of this will be, that a part of the ftroke of the pifton will be loft; and not only that, but the pifton, when the water leaves it, will rife very hard, as having a weight of water upon it, and the air of greater denfity above than below; whence the equilibrium, which ought to be in pumps, is deftroyed, and the ballance againft the workman. Now as this can happen even where the diameter of the fucking-pipe is equal to that of the pump-barrel, it muft happen much fooner when the fucking-pipe is lefs than the barrel; becaufe the water rifing through a lefs paffage will be longer in filling the pump-barrel, and confequently muft quit the pifton, and leave the greater void fpace between. On the contrary, if the leaft velocity of the water, rifing into the pipe, be greater than that of the pifton, there will be no void fpace; and the pump-barrel may be made in proportion as much wider than the fucking-pipe, as the velocity of the water is greater than that of the pifton. Now that this may be the cafe, we fhall fhew by calculation what diameters the barrel and pipe ought to have, compared with the velocity of the water and pifton. Let A (*ibid.*) reprefent the leaft altitude of the atmofphere A C = 31 feet of water; B = D F the higheft elevation of the pifton above the furface of the water

water HI, which let be 16 feet. And let the greatest velocity of the piston which can well be given to a pump be that of four feet in a second $= v$; and $V =$ the least velocity of the water that rises in the pipe; $D =$ the diameter of the barrel; and $d =$ the diameter of the pipe.

Now here we have $\sqrt{A} - \sqrt{B} = V =$ the least velocity of water; and the fall which will produce that velocity is the square of that expression, *viz.* $A + B - 2\sqrt{AB}$, that is, $31 + 16 - 2\sqrt{31 \times 10} = 2$ feet 6 inches, the height of the fall required. Whereas, by the common way of taking the square of $\sqrt{A - B}$, *viz.* $A - B$ for the height, we have 15 feet for the fall, which extraordinary error must be of very bad consequence in practice.

Here the velocity $\sqrt{A} - \sqrt{B} = \sqrt{31} - \sqrt{16} = 5,6 - 4 = 1,6$ per second. The velocity of the water, at the bottom of the pipe D, is as $\sqrt{A} = 5,6$; that also must be the velocity of the piston at D, that the water may follow it; whence the piston moving with the same velocity at F, where the velocity is but 1,6, we have $5,6 - 1,6 = 4$ feet of void space; therefore 4 parts in 5,6 of such a stroke, would be lost or ineffectual. We may here observe, by the way, that since the velocity of the water at D is 5,6, and the greatest velocity which can be given to the piston (without damaging the machinery) is but 4; therefore a piston, working at the lower end of the pipe or barrel, will always have water more than enough to prevent any void space or loss of labour. But, since we find so great a void in the pipe at F of the same diameter with the piston, it is evident, if we contract all the part below F into a small pipe as *FD*, and let the part FG remain as it was for the barrel for the piston to play in, as at *FG*, that then the water will rise into the barrel *FG* with a greater velocity than before, in proportion as the pipe is less; consequently, if the bore of the pipe *FD* be to that of the barrel *FG*, as the velocity of the piston P, or the water in the barrel, is to the velocity of the water in the pipe, there will always be a sufficiency of water to prevent a vacuum in the barrel. Which rule in symbols is thus expressed, $DD : dd :: V : v$; whence $D^2 v = d^2 V$ for a general canon; any three of which quantities being given, the fourth may be found. Thus, for example, suppose D, v, and V were given to find d, we have $d = \frac{D\sqrt{v}}{\sqrt{V}}$. Let the diameter of the barrel $D = 6$ inches; and suppose the piston gives 20 strokes in a minute, each a two feet stroke, spending as much time in its ascent as descent; then will the motion of the piston be 80 feet per minute, or $1\frac{1}{3}$ per second; whence $v = 1\frac{1}{3}$. Lastly, to obtain the value of V, we must fix on the length of the pipe *FD (ibid.)* which let be 16 feet; then the highest elevation of the piston will be 18 feet (if it comes to the bottom of the barrel, as it ought to do); wherefore, an height of water of 18 feet in the pump *GD*, acts against the weight or height of 31 feet in the leg AC. Now the velocity V of the water in the pipe *FD* being uniform, or constantly the same, we must find what difference of uniform velocities will be generated by falls from 31 and 18 feet heights. Thus $\sqrt{16\frac{1}{9}} : 32 :: \sqrt{31} : 43$ nearly; and $\sqrt{16\frac{1}{9}} : 32 :: \sqrt{18} : 32\frac{3}{4}$; whence the difference of these uniform velocities will be $43 - 32\frac{3}{4} = 10\frac{1}{4} =$ 10 feet three inches per second; therefore $V = 10\frac{1}{4}$. Wherefore $\frac{D\sqrt{v}}{\sqrt{V}} = d = 2\frac{1}{10}$ inches of the diameter of the pipe *FD*.

The reason why we make no use of the expression $\sqrt{AC} - \sqrt{DF}$ in this case, is, because this gives only the difference of the instantaneous velocities, or the least velocity with which the water at F can begin its motion upwards; whereas we here want to find what the constant and uniform motion of the water will be, or how much it will supply every second uniformly, which is done by the method above. For, since a fall of $16\frac{1}{9}$ gives an uniform velocity of 32 feet per second, a fall of 31 feet will give 43; thus a fall of 18 feet will give $32\frac{3}{4}$, and their difference must be that of the water at F.

If we know the velocity of the piston v, the diameter of the barrel D, and the diameter of the pipe d, we shall find the velocity of the water in the pipe V, $= \frac{vDD}{dd}$; or thus in words, multiply the square of the diameter of the barrel by the velocity of the piston; divide the product by the square of the diameter of the pipe, the quotient will be the velocity sought

ſought from the water in the pipe. This velocity, when found, muſt be taken from 43, the remainder 43 — V will be the uniform velocity produced by a fall from the higheſt ſituation of the piſton to the loweſt ſurface of the water in the well, and which is found by ſaying, as $32 : \sqrt{16\frac{1}{9}} :: 43 - V : \sqrt{DF}$; whence D F, the higheſt elevation of the piſton, will be known.

When we know D, V, and *d*, we find v the velocity of the piſton by this theorem $\frac{Vdd}{DD} = v$; that is, in words, multiply the ſquare of the diameter of the pipe by the velocity of the water in it, and divide the product by the ſquare of the diameter of the barrel, the quotient is the velocity of the piſton required.

Having given the velocity of the water in the pipe V, the diameter of the pipe *d*, the velocity of the piſton v, to find the diameter of the barrel D, we have this theorem $D = \sqrt{\frac{Vdd}{v}}$; that is, multiply the ſquare of the diameter of the pipe by the velocity of its water, and divide that product by the velocity of the piſton; the ſquare root of the quotient is the diameter of the barrel ſought.

We ſhall now proceed to the deſcription of two or three of the moſt uſeful pumps, but firſt give an account of that ſort of valves which are exceeding good, and ought to be uſed in pumps, and all kinds of water-engines, where valves are neceſſary.

Let A B C D (*ibid.* fig. 2.) be the bucket of a piſton, or any other part where a valve is required; in the middle there is a circular but tapering hole from top to bottom, in which is fitted the tapering or conical piece E F G H, with a piece I K to be ſcrewed in and out of the bottom part H G. It is to be ſcrewed out, when the ſaid ſolid E G is put into its place or hole in A C; and afterwards ſcrewed in, when the whole together appears as in the figure L M N O P. The piece E G now becomes a valve, or capable of permitting the water to aſcend, and to prevent its deſcent.

That the water puſhing againſt the bottom of the valve will raiſe it upwards, is evident from the conical form thereof, and its lying in the hole only by its own weight; the length of the key at K being ſufficient to permit ſuch a riſe of the valve, as will admit a ſpace between it and the hole for the water to paſs as freely as required; and, that the valve may not be thrown quite out of the hole, the croſs piece I is added, of a greater length than the diameter of the loweſt part of the valve.

If the valve E G and its ſocket A C be of braſs, and fitted, by grinding them with emery firſt and putty afterwards, with a drill-bow into each other, they will not only be water-tight, but even air-tight; and that too, if but ſlightly touched with the emery or putty: for if they are ground to a poliſh, the attraction of coheſion will take place, and prevent the valve from riſing ſo freely as it ought to do; yea, ſometimes thoſe ſurfaces have been found to cohere ſo ſtrongly, that the force of the riſing water could not overcome it: but all this would be prevented, and every thing ſucceed to one's wiſh, if they were made as above directed, as has been found by long experience and trying every way.

Kinds and ſtructure of PUMPS. Pumps are diſtinguiſhed into ſeveral kinds, according to the different manners of their acting; as the common ſucking pump, forcing pump, lifting pump, mercurial pump, *&c.*

1. The ſtructure and action of the common ſucking pump, as it is called, has been ſo far deſcribed in the above theory of pumps, that little remains to be ſaid on it. However, it may not be improper to give a figure or two of this kind of pump, in order to ſhew its ſtructure, and the contrivances uſed in working it. Fig. 3. *ibid.* repreſents a ſimple ſucking pump, in which A is the ciſtern; A B, the barrel or pipe, ſtanding in the water E F; G D, the piſton and bucket, with its bucket and valve D; and C, the valve open for the aſcent of the water. Fig. 4. *ibid.* n° 1 and 2. is a very ſimple and uſeful contrivance for making two pumps by means of the ballance A B; having large iron-balls at each end, placed in equilibre on the two ſpindles C, as repreſented in the figure; on the right and left are two boards I, nailed to two croſs-pieces faſtened to the axis of the machine. On theſe two boards, the perſon who is to work the pumps, ſtands, and ſupports himſelf by four poſts, E, D, erected perpendicularly, and having croſs-pieces on the top. At the diſtance of ten inches on each ſide of the axis, are faſtened the piſtons M, N, which go to the ſuckers. The man, by leaning alternately on his right and left foot, puts

the

the ballance in motion, by which means the pumps O, P, are worked, and the water thrown into the pipe H, and carried to a height proportional to the diameter of the valves, and the action of the ballance. It will be neceſſary to place on each ſide an iron-ſpring, as F, G, in order to return the ballance, and prevent its motion from being too great. Fig. 5. *ibid.* is another machine for working two pumps, where A repreſents a large weight faſtened to the axis, to regulate the motion of the machine. On each ſide of the axis B, is a piſton which goes to the ſuckers of the two pumps C, D. The machine is put in motion by the man's treading on the board E, and, conſequently, the two pumps deliver water alternately. All which is ſo plain from the figure, that it needs no farther deſcription.

2. The forcing pump has already been ſufficiently explained under the article FORCER.

3. The lifting pump is only a forcing pump of another ſtructure, repreſented in plate CCXVII. fig. 1. where A B is a barrel, fixed in the frame KILM; which alſo is fixed immoveable, with the lower part in the water to be exhauſted. G E Q H O is a frame with two ſtrong iron-rods, moveable through holes in the upper and lower parts of the pump IK and LM: in the bottom of this frame is fixed an inverted piſton BD, with its bucket and valve upon the top at D. Upon the top of the barrel, there goes off a part K H, either fixed to the barrel, or moveable by a ball and ſocket, (as here repreſented at F) but in either caſe ſo very nice and tight, that no water or air can poſſibly get into the barrel, which would ſpoil the effect of the pump. In this part, at C, is fixed a valve opening upwards. Now when the piſton-frame is thruſt down into the water, the piſton D deſcends, and the water below will ruſh up through the valve D, and get above the piſton; where, upon the frame's being lifted up, the piſton will force the water through the valve C up into the ciſtern P, there to run off by the ſpout. Note, this ſort of pump is ſet ſo far in the water, that the piſton may play below the ſurface of it.

Another excellent pump of the lifting ſort, is repreſented, *ibid.* fig. 2. which has this peculiarity, that its piſton works without friction. Its ſtructure is this: A B C D E F G H I K L is a kind of a box incloſing the piſton; this box conſiſts of two parts, *viz.* one upper, A B C I K L, and the under one, D E F G H, which ſhut upon each other. The piſton within, *ab*, is a circular piece of wood; about the circumference of which is nailed a piece of well-ſeaſoned leather, of a circular form, and ſo wide, that when the piſton is placed at the bottom of the box, the leather may lie over the ſides thereof at D H all around. The piſton and leather, thus placed on the upper part, is forced down upon the under one, and then both parts ſcrewed very faſt together. The manner of which is very eaſy to apprehend from the figure, where *igfdhk* is the leather going from the piſton through the jointure of the box. Upon the upper part of the piſton is fixed a circular (or any figured) piece of iron or wood, denoted by *def*, in the top of which, at *e*, is fixed the rod of the piſton Q C, by which the piſton is drawn up towards the upper part of the cavity *ln*, and from thence forced down again in working the pump. Now as the diameter of the piſton is leſs than that of the cavity, it is plain that in its motion up and down no friction can happen, as there are no parts for it to rub againſt, which is occaſioned by the contrivance of ſuſpending it on the leather. In the bottom part is fixed a pipe, F O, to bring up the water from the mine or well at O, which it delivers into the box by a valve at *c*. In the middle of the piſton is likewiſe another valve *m*, opening upwards. A M N L is a tube or cylindric pipe, in which the water is raiſed to a ciſtern to run off. It is eaſy to obſerve, that as the piſton is drawn up, the water will run in beneath, through the valve *c*, to prevent a vacuum; and alſo, that when the piſton is forced down, the water in the lower parts muſt be forced up through its valve; and when the piſton is raiſed again, the water above it will be forced up the pipe A M to the ciſtern. Another thing peculiar to this pump is, the ſhortneſs of the ſtroke of the piſton, which is compenſated by the largeneſs of its area, and the greater number of ſtrokes that may be made in the ſame time. The only objection to this pump is, that it is always charged with the weight of ſo much water, as is equal to a column of water, whoſe baſe is equal to the area of the piſton, and the height equal to that of the reſervoir.

4. The mercurial pump, or that which works

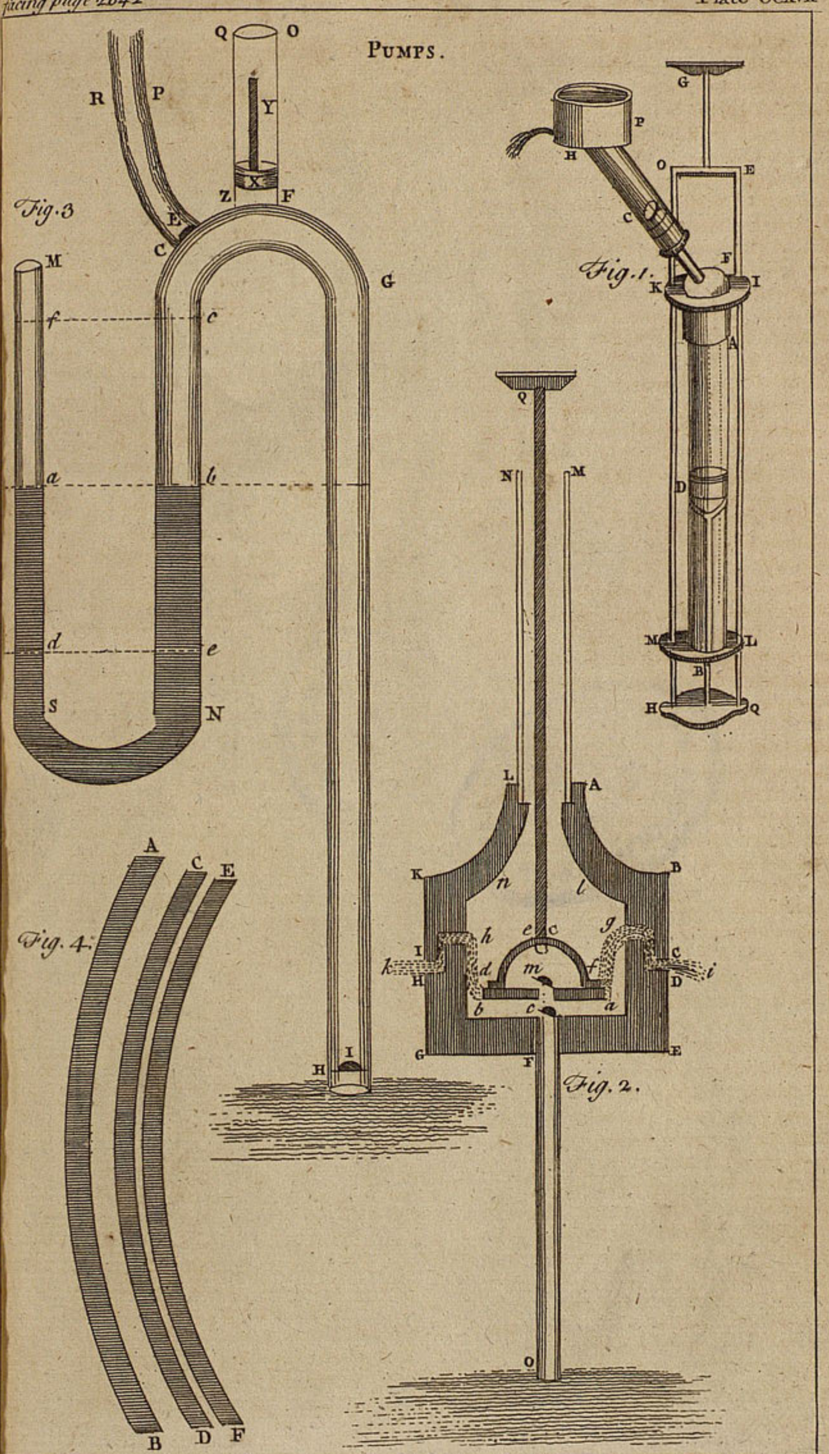

PUMPS.
Fig.1.
Fig.2.
Fig.3
Fig.4.
Q O Y X Z F R P E C G M f c a b d e S N
G P H O E C F K I A D M L B H Q
Q N M L A K B n l h e c g I k H d m f C i D b c a G F E O
A C E B D F
H I
T. Jefferys sculp.

Fig. 1.

The Mercurial PUMP.

Fig. 3.

Fig. 2.

Fig. 4 PURPURE

T. Jefferys sculp.

works by quick-filver, being one of the moft curious of the modern inventions, we fhall be the more full in its defcription, which is taken from a model. A B (plate CCXVIII. fig. 1.) is a ciftern placed on the top of a brafs-tube POQR, open at each end PR and OQ. Towards the upper part of the tube at F is inferted (or foldered) a curved pipe FG, opening into the tube at F; and in the end G is cemented a glafs-tube GH, fixed below in an hollow box LK, full of holes for the admiffion of water, into which it is immerfed. MNST is an exterior tube, open at the top MT, and clofe at the bottom NS; in which bottom is firmly fixed another hollow tube VXYW, clofe on the top XY, which may be a folid piece of wood. This inner tube or cylinder of wood goes up into the tube QORP, at the fame time that this is invefted by the exterior tube MNST, as is feen in the figure. In the lower part of the pipe at H is a diaphragm, and a valve I, opening upwards for the afcent of water when a vacuum is made. At CD in the main tube, above the infertion of the pipe, is another diaphragm and valve E, opening upwards alfo to give paffage to the water in the forcing part of the ftroke.

Now to explain the peculiar manner of working by quick-filver, which for that purpofe is poured into the exterior tube MS, which, when applied to the pump in its place, will be made to rife in two cylindric fhells; one about the tube of the pump outwardly; the other within, about the innermoft tube or plug XQ, as reprefented in the figure at *a*, *b*, and *c*, *d*. At the bottom there is but one cylindric fhell, becaufe the middle tube does not reach the bottom, leaving the fpace VOQW.

From this account it is eafy to obferve, that the part COQD anfwers to the barrel of the common pump, FGH to the pipe, the inner tube XQ to the pifton, and the quick-filver at bottom to the leathers of the common pifton; for it prevents all communication of the external air and internal part of the barrel, where the vacuum is to be made. Whence it is evident, that upon letting down the outer tube MS, it carries down the inner tube XQ at the fame time, and makes a larger fpace in the barrel and pipe, in which the air will be expanded or become rarer, and its fpring thereby weakened. In confequence of this, the water will rife through the valve at I into the pipe, and alfo the mercury will rife in the inner fhell by the preffure of the air on the outer fhell, till the equilibrium be reftored: and the height of the water raifed will be nearly 14 times as great as that of the mercury. When the tube SM is raifed again, the air will be compreffed within the barrel; and, its fpring increafing, it will act upon the water, the mercury of the inner fhell, and the valve E; the water above the valve I it cannot move, becaufe of the valve being fhut below; its whole force is therefore fpent on the mercury, and valve E; it will act on the inner fhell of mercury, and drive it down to the level of that in the outer fhell, as at *a b*, *c d*; and then the preffure will be every where equal, *viz.* on the inner and outer fhell, and on the valve E: as the tube after this continues moving up, the air will be farther compreffed, and its fpring made greater than that of the outward air, which therefore it will overcome, and fo thruft up the valve E, till fo much has efcaped as leaves the remainder in equilibrio with the atmofphere. The two fhells of mercury will be upon a level all the while the air is going through the valve, becaufe the preffure is not greater within than without. By repeating the operation a fecond time, the air will be farther rarified, and the water will again rife in the pipe; and thus on, till the pipe and barrel be full as in the common pump.

This pump made for common ufe, fhould have the following dimenfions: the length of the outer tube MN $=$ 30 inches, of the inner tube XO $=$ 31 inches, the diameter of the inner tube XY or QO $=$ fix inches, the thicknefs of the outer tube $=\frac{1}{10}$ of an inch, of the middle one $\frac{8}{100}$ of an inch, and of the inner one $\frac{13}{100}$ of an inch, and the bottom of the tube ZO to come within an inch of the bottom, NS, of the outer tube. Thefe dimenfions afford fufficient ftrength, if the tubes or barrels are made of copper, or caft iron, and of fuch a diameter, that the diftance between each may be $\frac{1}{2}$ the tenth of an inch, and this fhould be nicely effected, by having the tubes truly turned in a lathe. A tranfverfe fection of a part of the circumference of thefe tubes, with their thickneffes and the fpaces between, is reprefented in plate CCXVII. fig. 4.

where

where AB is the outer, CD the middle, and EF the inner tube. The ſpaces between are made ſo narrow, becauſe otherwiſe too great a quantity of mercury would be neceſſary; and yet of no manner of uſe, becauſe fluids preſs according to their altitude and not the quantity.

If now every part be fitted for work, and mercury poured in to the height of 24 inches, as ſhewn at *a*NS*d*; and the barrel and pipe be filled with water, ſo that the whole pump be full and in equilibrio with the atmoſphere; and if the outer tube be moved down 14 inches at the commencement of the motion, the equilibrium in the pump is deſtroyed by the greater ſpace, which will enſue upon the deſcent of the tube XQ, and which cannot be ſuffered, becauſe of the preſſure of the air on the water at H, and on the mercury in the outer ſhell at *a*, *d*. And becauſe the preſſures of the air outwardly at H and *a* are equal, but there is not an equal preſſure inwardly on the valve I, and the inner ſhell of mercury *b*, *c*; and the valve being preſſed with all the water in the pipe above it, which is proportional to the altitude *bg*; and the ſurface of the mercury of the inner ſhell at *b*, *c*, being preſſed only with the altitude of water C*b*, it is plain the water will not ruſh in at I, till the preſſure on *b*, *c*, becomes equal to it; and that will be, when the height of the inner ſhell at *b* is greater than that of the outer ſhell at *a* by near $\frac{1}{14}$ part of the difference of the altitude *bg*; and then the preſſure being equal at *b* and I, upon the motion of the tube XQ downwards, the water will be forced up through the valves at I, and the height of the mercury in the inner ſhell will always exceed that in the outer ſhell, in ſuch manner, that the exceſs will be about $\frac{1}{14}$ of *bg*, or the height of the point *b* above the water at H.

When the other tube is in its loweſt ſituation, the mercury in the inner ſhell will be nearly at the top, XY; and in the outer ſhell it will have but a ſmall height as *a*O, or Q*d*. And when the tube MS is drawn up again, the inner tube, XW, will force the water in the pump to act upon the upper part of the valve I, the under part of the valve E, and the ſurface of the mercury at *b*, in the inner ſhell. The valve I is thereby ſhut cloſe, the valve E it endeavours to puſh up but cannot, till it has firſt reduced the mercury in each ſhell to a level; after which, as the tube MS continues its motion upwards, the mercury will riſe in the outer ſhell, the preſſure on the inner one being now greateſt: and for every 14 feet the water is forced above the ſurface of the inner ſhell, *b*, the mercury will riſe in the outer one 1 foot.

The theory of the operation of this complex pump will be much more eaſily underſtood from conſidering the ſyphon, HGFZNSM (plate CCXVII. fig. 3.) which, though very ſimple, acts on the very ſame principles. HGF is the water-pipe, as in the pump; ZN repreſents the inner cylindric tube, and MS the outer one; OFZQ is the barrel in which the piſton YX moves (which is a forcer, or without a valve,) and CR a conduit-pipe to carry away the water forced through the valve E. In all this it is eaſy to ſee the analogy between this ſyphon and the mercurial pump. Its operation likewiſe is the ſame.

For let mercury be poured into the legs MS and ZN, it will come to a level at *a*, *b*. Now ſuppoſe the other part of the ſyphon full of water, and the piſton raiſed, it is plain the water at H cannot open the valve I, till a column of mercury be raiſed in the leg ZN above the ſurface of that in the outer leg MS, ſufficient to ballance the weight of the water in the pipe HF; then will the preſſure of the air be equal upon the water H, and the mercury in the leg MS; and as the motion of the piſton is continued, the water and mercury will continue to riſe with equal momenta, and therefore the mercury will riſe 1 inch for every 14 inches nearly, till the piſton ſtops.

When this happens, the ſurface of the mercury in the leg ZN will be at *c*, and that in the leg MS at *d*; and now, if the piſton be puſhed down again, it will cauſe the water to ſhut the valve I, and to act on the mercury at *c*, and on the valve at E, but the preſſure of the air at E will not ſuffer the valve to riſe till the preſſure there be greater within than without, which it cannot be, till the ſurface of mercury in the outer leg MS be higher than that in the inner one; wherefore, before the valve E can open, the mercury in each leg muſt come again to the level *a*, *b*; after which, the mercury will riſe in the outer leg MS, ſo as to be always in equilibrio with the water in the conduit-tube RC, and the part C*e* of the inner leg;

Fig. 1.

Fig. 2.

Mr. Smeaton's

Air-PUMP.

J. Jefferys sculp

leg; ſuppoſing the mercury now ſtands at e in that, and at f in the other: and then the ſaid height of the water will be nearly 14 times the height df, or ce. All this is very eaſy to underſtand from the common principles of hydroſtatics; and if this be underſtood, the nature of the pump muſt, as being the very ſame machine with a different diſpoſition of its parts.

From this theory of the mercurial pump, it is eaſy to infer, that in conſtructing one, the part Z F O Q ought to be placed in the middle of the height from the water H to be raiſed, to the ciſtern A B which receives and delivers it; or more nicely, the level ſurface $a\ b\ c\ d$ of the mercury when the pump is full, and juſt going to work, ought to be in the middle point of the line R g; the reaſon is, becauſe in the deſcent and aſcent of the tube M S, the differences between the altitudes of the outer and inner ſhells $a\ d$ and $c\ b$ are equal, and in each caſe a 14th part of the height of the water below or above it.

Suppoſe the whole height from the water to the piſton be Rg=60 feet; then aR =ag= 30 feet, or 360 inches; then alſo 14)360(26 nearly, that is, the difference of the altitudes in the mercurial ſhells will be about 26 inches. The place therefore where they ought to be on a level is at leaſt 13 inches below M, or the quick-ſilver muſt never be poured in to a height N a greater than about 15 or 16 inches, or 17 at moſt. If the height Rg be greater than 60 feet, the tubes M S, *&c.* muſt be proportionably enlarged.

General obſervations on PUMP-WORK. From what has been ſaid under the articles FLUID, ATMOSPHERE and GRAVITY, we preſume the reaſon will appear ſufficiently evident, why no ſingle pump, though perfectly tight, can raiſe water by a piſton playing at a greater diſtance than 32 feet; nor can this be remedied by ſeveral valves in the pipe below the piſton, as ſome have pretended: for let A B (plate CCXIX. fig. 1.) be the barrel of a pump, G F the piſton, B E a pipe going from the barrel to the water at E, 60 feet below it; and let B, C, D, E, be 4 valves placed in the pipe at 20 feet diſtance from each other. Now when the piſton is drawn up from B to F, a vacuum will be made between, but the valve B will not riſe by the water below it; for the water in the part B C cannot riſe itſelf, much leſs can that in the part C D below it, as being preſſed with the weight of the column above, and its own weight downwards, therefore no part of the watry column B F can move of itſelf, or by itſelf. Now no power can be applied any where but at E to move the whole column; nor can the whole be moved without raiſing all the valves at once; therefore the power able to raiſe the valve at E, and conſequently the valve at B, muſt be able to overcome the preſſure of a column of water 60 feet high: but the air can ſuſtain a column only of 32 feet high; therefore the air cannot raiſe the valve E, nor any of the reſt; and conſequently, the water cannot riſe in the barrel A B of a ſingle pump, if longer than 32 feet.

However, we may raiſe water by a compound-pump, ſuch as is repreſented in (plate CCXVIII. fig. 3.) where A is the rod of the piſton, which at B is divided into two, one of which goes to the barrel D E, and draws up the water from the ciſtern E F; the other part B C goes down to the ſaid ciſtern, where it is divided at C into two other parts; one going to the pump F G, ſupplies the water to the ciſtern E F; the other part CH goes to another pump I K below, and draws up the water from K to the ciſtern H I. Now theſe pumps all working at once, will draw water from any depth, provided each pump does not exceed 32 feet in height.

We ſhall conclude this ſubject with an account of one other method of raiſing water, by the natural agency of heat and cold only. It is as follows: A B C D (*ibid.* fig. 2.) is a pretty large veſſel filled with water to the height E F, the ſpace above being full of air. On the upper part of the veſſel is a tall tube inſerted G H, and deſcends below the ſurface of the water to K. On the nether part is another tube or pipe I W. In each tube is a valve opening upwards, as at I and G. The body of this inſtrument being nicely cloſed every where, ſo that no air can eſcape, and placed with the lower end in the water W, and thus continued in the hot ſun of a ſummer's day, the air will be rarified by the heat of the ſun in the upper part, and will compreſs the ſubjacent water, and force it up through the valve G into the tube G H, and by the cold of the following night it will be condenſed again; and then the preſſure of the atmoſphere will force the water at W up the pipe W I, to repleniſh the veſſel

veſſel each day: and, in this manner, may water be raiſed in a conſiderable quantity in the ſummer ſeaſon, and in hot climates.

By ſuch a contrivance, ſeveral curious effects may be produced: for by uſing a cylindrical cover to the veſſel, the ſun-beams may be collected in ſuch quantity, as to greatly rarify the air contained in it, ſo as to make it force out a conſiderable ſtream of water either through a tube or adjutage: thus alſo, an image may be made to weep in the ſun-beams, or at the approach of fire; with other devices of the ſame kind.

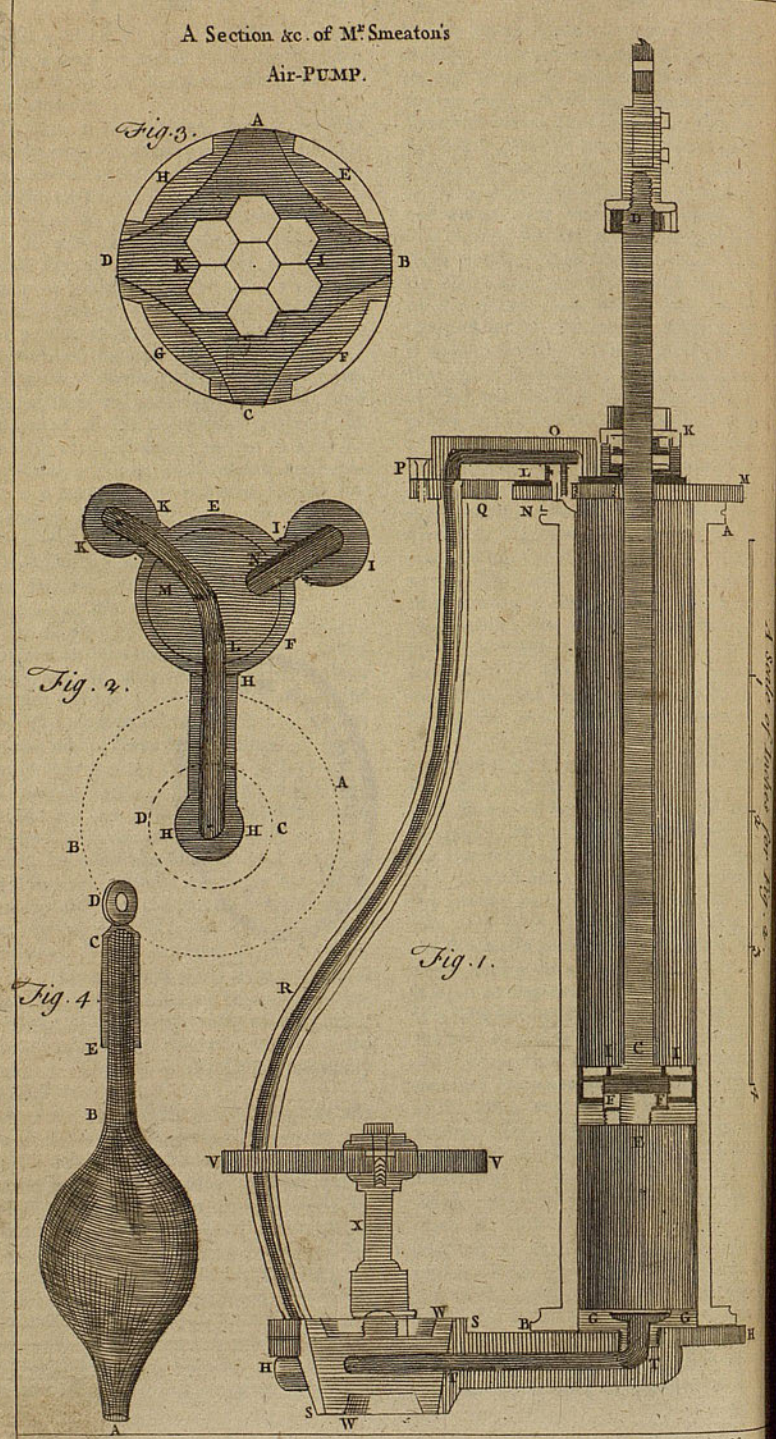
Air-PUMP. Having already given the deſcription of the common air-pump, and alſo that of the portable one, under the article AIR, it only remains to give an account of ſome conſiderable improvements made in that machine by the ingenious J. Smeaton; together with a perſpective view thereof, in plate CCXIX. fig. 2. and alſo a perpendicular ſection, *&c.* of it in plate CCXX. fig. 1, 2, *&c.*

One of the principal cauſes of imperfection in the common air-pumps, ariſes from the difficulty of opening the valves at the bottom of the barrels; to avoid which inconvenience, Mr. Smeaton has made uſe of ſeven holes inſtead of one; by which means, the valve is ſupported at proper diſtances, by a kind of grating, made by the ſolid parts between theſe holes: and to render the points of contact, between the bladder and grating, as few as poſſible, the holes are made hexagonal, and the partitions filed almoſt to an edge. He has alſo made the breadth of each hexagon $\frac{3}{10}$ of an inch, ſo that its ſurface is more than nine times greater than common; upon which account, as well as by reaſon of the greater number of holes, the valve may be raiſed with a ſixth part of the force commonly neceſſary.

Another imperfection is owing to the piſton's not fitting exactly, when put cloſe down to the bottom; which leaves a lodgment for air, that is not got out of the barrel, and proves of bad effect, by hindering the rarefaction from being carried on beyond a certain degree: for as the piſton riſes, the air will expand itſelf; but ſtill preſſing upon the valve, according to its denſity, it hinders the air within the receiver from coming out. Hence, were this vacancy to equal the 150th part of the capacity of the whole barrel, no air could ever come out of the receiver when once expanded 150 times, though the piſton was conſtantly drawn to the top. This inconvenience Mr. Smeaton has endeavoured to overcome, by ſhutting up the top of the barrel with a plate, having in the middle a collar of leathers, through which the cylindrical rod works, that carries the piſton. By this means, the external air is prevented from preſſing upon the piſton; but that the air, which paſſes through the valve of the piſton from below, may be diſcharged out of the barrel, there is alſo a valve applied to the plate at the top, that opens upwards. The conſequence of this conſtruction is, that when the piſton is put down to the bottom of the cylinder, the air in the lodgment under the piſton will evacuate itſelf ſo much the more, as the valve of the piſton opens more eaſily, when preſſed by the rarified air above it, than when preſſed by the whole weight of the atmoſphere. Hence, as the piſton may be made to fit as nearly to the top of the cylinder, as it can to the bottom, the air may be rarified as much above the piſton, as it could before have been in the receiver. It follows, therefore, that the air may now be rarified in the receiver, in the duplicate proportion of what it could be upon the common principles; every thing elſe being ſuppoſed perfect.

Mr. Smeaton has alſo improved upon the gages, commonly uſed for meaſuring the expanſion of the air; which his gage will do with certainty, to much leſs than the 1000th part of the whole. It conſiſts of a bulb of glaſs, ſomething in the ſhape of a pear, and ſufficient to hold about half a pound of quick-ſilver. It is open at one end, and at the other end is a tube hermetically cloſed at top. By the help of a nice pair of ſcales, he found what proportion of weight a column of mercury of a certain length, contained in the tube, bore to that which filled the whole veſſel; and, by theſe means, was enabled to mark diviſions upon the tube, anſwering to the $\frac{1}{1000}$th part of the whole capacity; which being about $\frac{1}{10}$th of an inch each, may, by eſtimation, be eaſily ſubdivided into leſſer parts. This gage, during the exhauſting of the receiver, is ſuſpended therein by a ſlip-wire; and when the pump is worked as much as ſhall be thought neceſſary, the gage is puſhed down, till the open end is immerged in a ciſtern


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A Section &c. of Mr. Smeaton's
Air-PUMP.
Fig. 3.
Fig. 2.
Fig. 1.
Fig. 4.
A Scale of Inches for Fig. 2.

T. Jefferys

ciftern of quick-filver, placed underneath: the air being then let in, the quick-filver will be driven into the gage, till the air remaining in it becomes of the fame denfity with the external air; and as the air always takes the higheft place, the tube being uppermoft, the expanfion will be determined by the number of divifions occupied by the air at top.

He has alfo endeavoured to render the pneumatic apparatus more fimple and commodious, by making the air-pump act as a condenfing engine at pleafure, by only turning a cock: this renders the pump an univerfal engine for fhewing any effect, that arifes from an alteration in the denfity or fpring of the air; and with a little addition of apparatus, it fhews the experiments of the air-fountain, wind-gun, *&c.* This is done in the following manner: the air above the pifton being forcibly driven out of the barrel at each ftroke, and having no where to efcape but by the valve at top; if this valve be connected with the receiver, by means of a pipe, and at the fame time the valve at the bottom, inftead of communicating with the receiver, be made to communicate with the external air, the pump will then perform as a condenfer. The mechanifm is thus ordered: there is a cock with three pipes placed round it, at equal diftances. The key is fo pierced, that any two may be made to communicate, while the other is left open to the external air. One of thefe pipes goes to the valve at the bottom of the barrel; another goes to the valve at the top; and a third goes to the receiver. Thus, when the pipe from the receiver, and that from the bottom of the barrel, are united, the pump exhaufts: but turn the cock round, till the pipe from the receiver, and that from the top of the barrel communicate, and it then condenfes. The third pipe in one cafe, difcharges the air taken from the receiver into the barrel; and, in the other, lets it into the barrel, that it may be forced into the receiver.

But the following figures will ferve to render the ftructure and ufe of this excellent machine ftill more plain. Plate CCXIX. fig. 2. is a perfpective view of the feveral parts of the pump together. A is the barrel; B the ciftern, in which are included the cock, with feveral joints: thefe are covered with water, to keep them air-tight. A little cock to let the water out of the ciftern, is marked *h*. C *c c* is the triangular handle of the key of the cock; which, by the marks on its arms, fhews how it muft be turned, that the pump may produce the effect defired. D H is the pipe of communication between the cock and the receiver; E is the pipe, that communicates between the cock and the valve, on the upper plate of the barrel. F is the upper plate of the pump, which contains the collar of leathers *d*; and V, the valve, which is covered by the piece *f*. G I is the fiphon gage, which fcrews on and off, and is adapted to common purpofes. It confifts of a glafs-tube hermetically fealed at *c*, and furnifhed with quick-filver in each leg; which, before the pump begins to work, lies level in the line *a b*; the fpace *b c* being filled with air of the common denfity. When the pump exhaufts, the air in *b c* expands, and the quick-filver in the oppofite leg rifes, till it become a counter-ballance to it. Its rife is fhewn upon the fcale I *c*, by which the expanfion of the air in the receiver may be nearly judged of. When the pump condenfes, the quick-filver rifes in the other leg, and the degree may be nearly judged of by the contraction of the air in *b c*; marks being placed at $\frac{1}{2}$ and $\frac{1}{3}$ of the length of *b c* from *c*, which fhews when the receiver condenfes double or treble its common quantity. K L is a fcrew frame to hold down the receiver, in condenfing experiments, which takes off at pleafure; and is fufficient to hold down a receiver, the diameter of whofe bafe is 7 inches, when charged with a treble atmofphere: in which cafe it acts with a force of about 1200 pounds againft the fcrew-frame. M is a fcrew, that faftens a bolt, which flides up and down in that leg, by means whereof the machine is made to ftand faft on uneven ground.

Fig. 1. plate CCXX. reprefents a perpendicular fection of the barrel and cock, *&c.* of the pump; where A B is the barrel, C D the rod of the pifton, which paffes through M N, the plate that clofes the top of the barrel. K is the collar of leathers, through which the pifton-rod paffes. When the pifton is at the bottom of the cylinder, the upper part of K is covered by the cap at D, to keep out duft, *&c.* L is the valve on the upper plate, which is covered by the piece O P, which is connected with the pipe Q R, which makes the communication between the

valve and cock. CE is the piſton, and EFF the piſton-valves. II are two little holes to let the air paſs from the piſton-valves into the upper part of the barrel. GG is the principal valve at the bottom of the cylinder. HH is a piece of metal, into which the valve GG is ſcrewed, and cloſes the bottom of the cylinder; out of which is alſo compoſed SS the cock, and KTT the duct from the cock to the bottom of the barrel. WW is the key of the cock. X the ſtem, and VV the handle.

Fig. 2. *ibid.* is an horizontal ſection of the cock, through the middle of the duct TT. AB repreſents the bigneſs of the circular plate, that cloſes the bottom of the barrel, and CD the bigneſs of the inſide of the barrel. EFG is the body of the cock; the outward ſhell being pierced with three holes at equal diſtances, and correſponding to the three ducts HH, II, KK, whereof HH is the duct that goes to the bottom of the barrel; II, the duct that communicates with the top of the barrel; and KK, the duct that paſſes from the cock to the receiver. LMN is the key, or ſolid part of the cock, moveable round in the ſhell EFG. When the canal LM anſwers to the ducts HH and KK, the pump exhauſts, and the air is diſcharged by the perforation N. But the key LMN being turned till the canal LM anſwers to the ducts II and KK, the perforation N will then anſwer to the duct HH, and in this caſe the pump condenſes. Laſtly, when N anſwers to KK, the air is then left in or diſcharged from the receiver, as the circumſtance requires.

Fig. 3. *ibid.* is the plan of the principal valve; where ABCD repreſents the bladder faſtened in four places, and ſtretched over the ſeven holes IK, formed into an hexagonal grating, which Mr. Smeaton chooſes to call the honey-comb. EFGH, ſhews where the metal is a little protuberant, to hinder the piſton from ſtriking againſt the bladder.

Fig. 4. *ibid.* repreſents the new gage, called from its ſhape the pear-gage, which is open at A. BC is the graduated tube, which is hermetically cloſed at C, and is ſuſpended by the piece of braſs DE; which is hollowed into a cylinder, and claſps the tube.

PUN, or PUNN, a conceit ariſing from the uſe of two words that agree in ſound, but differ in the ſenſe. Ariſtotle deſcribes two or three kinds of puns among the beauties of good writing, and produces inſtances of them out of ſome of the greateſt authors in the greek tongue. Cicero has ſprinkled ſeveral of his works with puns; and in his book, where he lays down the rules of oratory, quotes abundance of ſayings, which he calls pieces of wit, that upon examination prove perfect puns.

Puns, when they come eaſily, and are very ingenious, poignant and appoſite, are allowed of in converſation, letters, epigrams, madrigals, mottos, devices, *&c.* but are abſolutely baniſhed out of the grave, ſerious, and ſublime, by reaſon they weaken its force, and diminiſh its beauty, which conſiſts in ſomething great and elevated.

PUNA ISLE, an iſland of South-America, ſituated in the pacific Ocean, at the entrance of the bay of Guiaquil, in weſt long. 80°, ſouth. lat. 3° 15′.

PUNCH, an inſtrument of iron or ſteel, uſed in ſeveral arts, for the piercing or ſtamping holes in plates of metals, *&c.* being ſo contrived as not only to perforate, but to cut out and take away the piece. The punch is a principal inſtrument of the metal-button-makers, wafer-makers, patch-makers, ſhoe-makers, *&c.* See BUTTON *making*, *&c.*

PUNCH-HORSE, in the manege, is a well ſet, well knit, horſe, ſhort backed and thick ſhouldered, with a broad neck, and well lined with fleſh.

PUNCH is alſo a name for a ſort of compound drink, much uſed here, and in many parts abroad, particularly in Jamaica, and ſeveral other parts of the Weſt-Indies.

Its baſis is ſpring-water, which being rendered cooler, briſker, and more acid, with lemon-juice, and ſweetened again to the palate with fine ſugar, makes what they call ſherbet; to which a proper quantity of ſpirituous liquor, as brandy, rum, or arrack, being added, the liquor commences punch: the proportion of the ingredients are various; ſome, inſtead of lemon-juice, uſe lime-juice, which makes what they call punch-royal; this is found leſs liable to affect the head, and is more grateful to the ſtomach: ſome alſo make milk-punch, by adding as much milk to the ſherbet as there is water: others uſe green tea inſtead of water: and what is called chambermaid's punch is made without any water, of lime-juice, twice as much

white-

white wine as lime-juice, and four times as much brandy with sugar.

Several authors condemn the use of punch as prejudicial to the brain and nervous system.

PUNCHEON, PUNCHIN, or PUNCHION, a little block or piece of steel, on one end whereof is some figure, letter, or mark, engraven either in creux or relievo, impressions whereof are taken on metal, or some other matter, by striking it with a hammer on the end not engraved. There are various kinds of these puncheons used in the mechanical arts; such for instance are those of the goldsmiths, cutlers, pewterers, *&c.*

The puncheon, in coining, is a piece of iron steeled, whereon the engraver has cut in relievo the several figures, arms, effigy, inscription, *&c.* that are to be in the matrices, wherewith the species are to be marked. Minters distinguish three kinds of puncheons, according to the three kinds of matrices to be made; that of the effigy, that of the cross or arms, and that of the legend, or inscription. The first includes the whole portrait in relievo: the second are small, each only containing a piece of the cross or arms; for instance, a fleur-de-lys, an harp, a coronet, *&c.* by the assemblage of all which the intire matrice is formed. The puncheons of the legend only contain each one letter, and serve equally for the legend on the effigy side and the cross side. See the article COINING.

For the manner of engraving, tempering, and stamping these puncheons, to form the matrices, see the articles ENGRAVING, MATRICE, *&c.*

For the puncheons used in stamping the matrices wherein the types of printing characters are cast, see *Letter* FOUNDERY.

PUNCHEON is also used for several iron-tools of various sizes and figures, used by the engravers in creux on metals. Seal-gravers particularly use a great number for the several pieces of arms, *&c.* to be engraven, and many stamp the whole seal from a single puncheon.

PUNCHEON is also a common name for all those iron instruments used by stone-cutters, sculptors, blacksmiths, *&c.* for the cutting, inciding, or piercing their several matters.

Those of sculptors and statuaries serve for the repairing of statues when taken out of the moulds; the locksmiths use the greatest variety of puncheons; some for piercing hot, others for piercing cold; some flat, some square, some round, others oval, each to pierce holes of its respective figure in the several parts of locks.

PUNCHEON, in carpentry, is a piece of timber placed upright between two posts, whose bearing is too great, serving, together with them, to sustain some large weights.

This term is also used for a piece of timber raised upright, under the ridge of a building, wherein the little forces, *&c.* are jointed.

PUNCHEON is also used for the arbor, or principal part of a machine, whereon it turns vertically, as that of a crane, *&c.*

PUNCHEON is also a measure for liquids, containing an hogshead and one third, or eighty-four gallons.

PUNCTA LACRYMALIA. See the article LACRYMAL.

PUNCTATED HYPERBOLA, an hyperbola whose oval conjugate is infinitely small, *i. e.* a point. See HYPERBOLA.

PUNCTION, in surgery, the same with puncture. See PUNCTURE.

PUNCTUATION, in grammar, the art of pointing or of dividing a discourse into periods, by points, expressing the pauses to be made in the reading thereof. See the article POINT.

PUNCTUM, in geometry, *&c.* See the article POINT.

The punctum formatum, or generatum, in conics, is a point determined by the intersection of a right line drawn through the vertex of a cone to a point in the plane of the base that constitutes the conic section. See the articles CONE and CONIC SECTIONS.

The punctum ex comparatione denotes either of the foci of an ellipsis and hyperbola, thus called by Apollonius, because the rectangles under the segment of the transverse diameter in the ellipsis, and under that and the distance between the vertex and the focus in the hyperbola, are equal to one fourth part of what he calls the figure thereof. See FOCUS, ELLIPSIS, and HYPERBOLA.

The punctum lineans, is a term used by some authors for that point of the generating circle of a cycloid, or epicycloidal line. See the article CYCLOID.

PUNCTUM SALIENS, in anatomy, the first rudiments of the heart in the formation of the fœtus, where a throbbing motion is perceived. This is said to be easily observed with a microscope in a brood egg, wherein, after conception, we

we see a little speck or cloud, in the middle whereof is a spot that appears to beat or leap a considerable time before the foetus is formed for hatching. See the article FOETUS.

PUNCTURE, in surgery, any wound made by a sharp pointed instrument.

The puncture upon the external parts, and not penetrating deep, is reckoned the most simple wound. In this, after the blood has been stopped at the first dressing, by the application of dry lint, the common digestive, or balsamum Arcaei is to be spread upon a pledgit, and applied once every day; or if the discharge is but small, every other day, covering the dressing with a plaster and compress, and securing the whole with a proper bandage: the first dressings that are applied, especially where there has been a flux of blood, should by no means be removed forcibly, but be left till they fall off of themselves, which they will do when the suppuration is formed. But when a puncture penetrates very deep, the cure is attended with many difficulties, especially if it is made perpendicularly down, and has no depending orifice; for in this case the blood and matter are easily collected at the bottom, and protract the cure, and frequently form fistulae. To prevent these consequences it will be proper to press the wound from the bottom upwards, and to apply a compress towards the fundus of the wound externally, and what is called the expelling bandage over all, as it presses much lighter upon the lower than the upper parts: but if all this precaution should prove of no effect, it will be adviseable to make a large opening at the bottom of the wound, before any fistulae are formed, by a probe, in which case great care must be taken that the orifices are not healed before the bottom of the wound; this is to be effected by a short, soft tent, which, when the wound is healed at the bottom, may be removed, and the orifices healed. How wounds of this kind are to be treated, which penetrate into the cavity of the thorax, or abdomen, may be seen under ABDOMEN, THORAX, GASTRORAPHY, &c.

PUNICA, the POMEGRANATE-TREE, in botany, a genus of the icosandria-monogynia class of plants, the corolla whereof consists of five roundish, erect, patent petals, inserted into the calyx: the fruit is a large globose apple, coronated with the calyx, and formed into nine cells; the seeds are numerous and succulent: the receptacle is membranaceous, and divides every cell of the fruit into two parts. The flowers of the pomegranate, and the bark of the fruit, are strongly astringent.

PUNISHMENT, in law, the penalty which a person incurs on the breach or transgression of any law.

The forms and manners of punishment are various in different ages and countries, and for various crimes, as treason, felony, adultery, parricide, &c. Among us the principal civil punishments are fines, imprisonments, the stocks, pillory, burning in the hand, whipping, ducking-stool, hanging, beheading, quartering, burning, transportation, &c. The ecclesiastical punishments are censures, suspensions, deprivations, degradations, excommunications, anathemas, penances, &c. The military punishments are being shot, running the gantelope, riding the wooden horse, &c.

PUNITORY INTEREST, in the civil law, such interest of money as is due for the delay of payment, breach of promise, &c.

PUPIL, *pupillus*, in the civil law, a boy or girl not yet arrived at the age of puberty, *i. e.* the boy under fourteen years, the girl under twelve. While a minor remained under the direction of a tutor, he was called a pupil; after puberty, a curator being assigned him, he ceased to be called a pupil. A tutor is obliged to pay interest for what monies of his pupil lie idle and unemployed; and is allowed to do any thing for his pupil, but nothing against him. See the article TUTOR.

PUPIL is also used in universities, &c. for a youth under the education or discipline of any person.

PUPIL, *pupilla*, in anatomy, a little aperture in the middle of the uvea and iris of the eye, through which the rays of light pass to the crystalline, in order to be painted on the retina, and cause vision. See the articles EYE, IRIS, and UVEA.

The structure of the uvea and iris, is such as that by their aperture the pupil is contractible and dilatible at pleasure, so as to accommodate itself to objects, and to admit more or fewer rays, as the object, being either more vivid and near, or more obscure and remote, requires more or less light: it being a constant law, that the more luminous the object is, the smaller the pupil; and again, the nearer the object, the smaller the pupil; and *vice versa*. This alteration of the

pupil

pupil is effected by certain muscular fibres on the outside of the uvea, which arrive from the nerves detached hither from the sclerotica: some others attribute the motion of the pupil to the ligamentum ciliare; and others think that both this and the fibres of the uvea concur herein.

There is a disease of the eyes called a contraction of the pupil, wherein there is such a total or close contraction of that part, that it will not transmit light enough to the bottom of the eye, to enable the patient to see objects distinct; sometimes this disorder is from infancy, and sometimes it arises from an intense inflammation of the eye. The cure of this is extremely difficult; but Mr. Cheselden has invented a method by which he has often proved very successful in his attempts to relieve it. The method is this: the eye-lids being held open by a speculum oculi, he takes a narrow, single edged scalpel, or needle, almost like that used in couching for the cataract, and passing it through the sclerotica, as in couching, he afterwards thrusts it foreward through the uvea, or iris, and in extracting cuts it open through the iris. See the article COUCHING.

PURA ELEMOSYNA, PURE ALMS, denotes a tenure whereby the churchmen hold lands in Scotland, somewhat on the footing of the primitive clergy.

PURBECK ISLE, the south-east division of the county of Dorset.

PURCHASE, in law, the buying or acquiring of lands, *&c.* with money, by deed or agreement, and not by descent or right of inheritance.

A joint purchase is when two or more persons join together in the purchase. Purchasers of lands are to take notice of all charges thereon: there are, however, certain statutes to guard against fraudulent incumbrances. The court of Chancery will relieve the purchaser of a term against a title that lay dormant where money has been laid out on improvements.

PURCHASE, in the sea language, is the same as draw in: thus when they say the capstan purchases a-pace, they only mean it draws in the cable a pace.

PURE, something free from any admixture of foreign or heterogeneous matters: thus we say pure fire, *&c.* See the article FIRE, *&c.*

PURE HYPERBOLA, in conics, is an hyperbola without any oval, nodes, spike, or conjugate point. See CURVE.

PURFLEW, a term in heraldry, expressing ermins, peans, or any of the furs, when they compose a bordure round a coat of arms: thus they say, he beareth gules a bordure, purflew, vairy: meaning that the bordure is vairy.

PURGATION, the art of purging, scouring, or purifying a thing, by separating, or carrying off any impurities found therein: thus,

In pharmacy, purgation is the cleansing of a medicine by retrenching its superfluities. In chemistry, it is used for the several preparations of metals and minerals intended to clear them of their impurities, more usually called purification and refining. See REFINING.

In medicine, purgation is an excretory motion arising from a quick and orderly contraction of the fleshy fibres of the stomach and intestines, whereby the chyle, corrupted humours, and excrements lodged therein, are protruded further and further, and at length quite excluded the body by stool. See the articles CATHARTICS and EVACUATION.

For the menstrual purgations of women, see the article MENSES.

PURGATION, in law, signifies the clearing a person's self of a crime of which he is suspected and accused before a judge. This purgation is either canonical or vulgar. Canonical purgation is prescribed by the canon-law, and the form thereof in the spiritual court is usually thus: the person suspected takes his oath that he is innocent of the crime charged against him; and at the same time brings some of his neighbours to make oath that they believe he swears truly. Vulgar purgation was antiently by fire or water, or else by combat, and was practised here till abolished by our canons. See the article COMBAT, *&c.*

PURGATIVE, or PURGING MEDICINES, a medicament which evacuates the impurities of the body by stool, called also cathartics. See CATHARTICS.

We have had attempts of adjusting the doses of purgative medicines scientifically. Dr. Cockburn endeavoured at the solution of this problem, but, it is said, on wrong principles. Dr. Balguy, in the Medical Essays of Edinburgh, has also given us an essay on this subject. He assumes, that part of the medicines is spent on the first passages, where it acts

as

as a ftimulus; and that the other part is carried into the blood, and has its effects there by thinning and rarifying it. This being premifed, 1. If the medicine acts only in the firft paffages, the dofe will be as the fize of the perfon into the conftitution. 2. If the whole medicine paffes into the blood, the dofe will be as the fize into the fquare of the conftitution; and, therefore, 3. You are to dofe fo much of the medicine as is fpent on the ftomach and inteftines directly as the conftitution, and fo much as is carried into the blood as the fquare of the conftitution; and the fum into the perfon's fize is the quantity required. The fame rules hold in vomits. How far in either cafe the practice of phyfic may be thereby improved, we leave to the judgment of the learned. The folution of the problem fuppofes a great poftulatum, no lefs than the art of meafuring a perfon's conftitution.

PURGATORY, a place in which the juft who depart out of this life, are fuppofed to expiate certain offences which do not merit eternal damnation.

Broughton has endeavoured to prove, that this notion has been held by pagans, jews, and mahometans, as well as by chriftians.

The doctrine of purgatory is a very lucrative article to the clergy of the romifh church, who are very liberally paid for maffes and prayers for the fouls of the deceafed. We are told by fome of their doctors, that purgatory is a fubterraneous place fituated over the hell of the damned, where fuch fouls as have not yet made fatisfaction to divine juftice for their fins, are purged by fire, after a wonderful and incomprehenfive manner: and here they are purified from thofe dregs which hinder them from entering into their eternal country, as the catechifm of the council of Trent expreffes it.

PURGE, in medicine, the fame with cathartics. See the article CATHARTICS.

PURIFICATION, in matters of religion, a ceremony which confifts in cleanfing any thing from a fuppofed pollution or defilement.

The pagans, before they facrificed, ufually bathed or wafhed themfelves in water, and they were particularly careful to wafh their hands, becaufe with thefe they were to touch the victims confecrated to the gods. It was alfo cuftomary to wafh the veffel with which they made their libations. The mahometans ufe purifications as previous to the duty of prayer; thefe alfo are of two kinds, either bathing, or only wafhing the face, hands and feet. The firft is requefted only in extraordinary cafes, as after having lain with a woman, touched a dead body, &c. But left fo neceffary a preparation for their devotion fhould be omitted, either where water cannot be had, or when it may be of prejudice to a perfon's health, they are allowed in fuch cafes to make ufe of fine fand, or duft inftead of it; and then they perform this duty by clapping their open hands on the fand, and paffing them over the parts, in the fame manner as if they were dipped in water.

There were alfo many legal purifications among the Hebrews. When a woman was brought to bed of a male child, fhe was efteemed impure for forty days; and when of a female, for fixty; at the end of which time fhe carried a lamb to the door of the temple, to be offered for a burnt-offering, and a young pigeon or turtle for a fin offering, and by this ceremony fhe was cleanfed or purified. For other purifications of the Jews, fee the article IMPURITY.

Among the romanifts, the holy water is ufed by way of purification.

PURIFICATION *of the bleffed Virgin*, a feftival of the chriftian church, obferved on the fecond of February, in memory of the purification of Chrift in the temple, and his mother's fubmitting to the jewifh law of purification, after the birth of a male-child.

PURIFICATION, in chymiftry, the act of purifying or refining natural bodies, by feparating the fæces and impurities from them. For the method of purifying metals, fee the article REFINING, &c.

For the purification of femi-metals, fee the articles ANTIMONY, SULPHUR, &c.

PURIM, or *the feaft of lots*, a folemn feftival of the Jews, inftituted in memory of the deliverance they received from Haman's wicked attempt to deftroy them, by means of Mordecai and Efther.

PURITAN, a name formerly given in derifion to the diffenters from the church of England, on account of their profeffing to follow the pure word of God, in oppofition to all traditions and human conftitutions. See the articles INDEPENDENTS, PRESBYTERIANS, &c.

PURLINS, in building, thofe pieces of timber that lie acrofs the rafters on the infide,

inside, to keep them from sinking in the middle of their length.

By the act of parliament for rebuilding of London, it is provided, that all purlins from fifteen feet six inches, to eighteen feet six inches long, be in their square nine inches and eight inches; and all in length from eighteen feet six inches, to twenty-one feet six inches, be in their square twelve inches and nine inches.

PURLUE, or PURLIEU, signifies all that ground near any forest, which being made forest by king Henry II. Richard I. and king John, was afterwards by perambulations and grants of Henry III. severed again from the same, and made purlieu; that is to say, pure and free from the laws of the forest.

The owners of grounds within purlieus, may convert pasture into arable, *&c.* as also inclose them with any kind of inclosures, or erect edifices upon them, and may dispose of the same as if they had never belonged to the forest: hence if the wild beasts chance to wander out of the forest into the purlieu, the king has still a property in them, against every man except the owner of the ground in which they are, who hath a special property in them *ratione soli*; yet so far as he may take them by hunting with his greyhounds or dogs, without any forestalling or forestetting them in their course again towards the forest.

PURLUE-MAN, or PURLIEU-MAN, a person who has ground within the purlieu, and is qualified to hunt within the same, though under certain restrictions.

By a statute of Car. II. no man may keep greyhounds within the purlieu, or elsewhere within England and Wales, unless he have a free warrant, or be lord of a manor, or such a freehold as is seised in his own right, or in right of his wife, of lands, tenements, or hereditaments, of the clear yearly value of 40 l. over and above all the charges of reprises of such estate of inheritance; or of lands, tenements, *&c.* in his own right, or in the right of his wife, for the term of life or lives, of the yearly value of 80 l. over and above all charges and reprises; or that is worth in goods or chattels 400 l. Others that are not thus qualified, and yet have land in the purlieus, if they find beasts of the forest in their own ground, within the purlieu, may chase them out with little dogs, though not with greyhounds.

PURPLE, a colour composed of a mixture of red and blue.

A beautiful transparent purple for painting, may be made by boiling four ounces of rasped brasil-wood in a pint of stale beer, and half an ounce of logwood, till the liquor is heightened to the colour you desire, which may be known by dipping a piece of paper in it. If you find it too red, add a quarter of an ounce more of logwood, which will render it still deeper, and by this method you may bring it to any degree of purple, by putting in either more or less logwood to the former composition, and fixing it with alum. This will produce such a clear purple, as no mixture of reds and blues will produce. Madam Mariana of Amsterdam, famous for painting in miniature, and for her excellent manner of illuminating prints, says, that the best purple that can be made, may be composed between the carmine and indigo; to strengthen which, on the red side, you may add lake, between the lighter and darker part: and so lake, when it is used in the same way, on the foregoing purple, produces a very fine effect.

To dye stuffs, &c. *a* PURPLE. Allow a sufficient quantity of fair water to every pound of stuff, one pound of tartar, and two ounces of alum, in which boil the stuff for an hour; then take it out, cool and rinse it; after this, warm some clean water, into which put three ounces of brasil-wood; boil it half an hour, and then work the stuffs in it, till they are as red as desired: upon which take them out, and put into the dye two ounces of pot-ashes; stir it well about; put in the stuff once more; roll it off and on the roller, that it do not spot; then cool, and rinse it out.

To dye stuffs of a lasting purple. For this purpose the stuff, when white, ought to be very clean and free from spots and stains, that it may have the better lustre when dyed. To give it the blue cast, the stuff must be first dyed to the depth of a sky-colour with wood or indigo, and then dried. To give it the deepening, boil half a pound of brasil, and divide it into four parts, and dye it time after time in each with the following mixture: To the first part of the brasil add one dram of saltpetre, and one dram of sal armoniac powder; to the second, add a quarter of an ounce of powdered galls, and half an ounce of Paris-red; to the third, a quarter of an ounce of galls, and

and a quarter of an ounce of calcined tartar, and of alum and ſaltpetre, each a dram. The fourth time, add a quarter of an ounce of galls powdered, as much turmeric, and a quarter of ſharp lye, and you will have a beautiful colour.

To dye ſilk a ſlight purple, put it into the ſlighter red-dye; but increaſe the quantity of pot-aſhes, to turn it to purple; then rinſe and dry it.

To dye thread of a purple-colour, firſt alum the thread with three pounds of alum, half a pound of tartar, and two ounces of braſil; dry it, and draw it through the wood or indigo-dye; then rinſe it clean, and dry it again: to deepen it, take ten ounces of braſil, being firſt boiled, which liquor divide into three parts, to be uſed at three times. To the firſt add half an ounce of paris-red, one dram of maſtich, and a quarter of an ounce of calcined tartar; always drying the thread, after you have uſed every one of the parts of the liquor. The ſecond time, add half an ounce of turmeric, two drams of cinnabar, and half an ounce of gum-arabic. The third time, when the thread becomes reddiſh, add a quart of ſharp lye; and by this means the thread will obtain a laſting colour.

Purple fever, the ſame with miliary fever. See Miliary fever.

PURPURA, in natural hiſtory, a genus of ſimple ſhells, having no hinge, formed of one continuous piece, and covered from the top to the bottom with ſpines, tubercles, and umbos: the mouth is ſmall, and approaches to a round figure: the clavicle is ſhort, but the other extremity is uſually protended to a conſiderable length.

To this genus belong, 1. The thorny woodcock ſhell, or yellow purpura, with long and ſomewhat crooked ſpines. (See plate CCXXI. fig. 1. n° 1.). 2. The common woodcock-ſhell, or variegated yellowiſh purpura, with tubercles, and a very long beak (*ibid.* n° 2.). 3. The endive-ſhell, or ſhort-beaked purpura, with ſix ſeries of laciniated ſpines (*ibid.* n° 3.). 4. The caltrop-ſhell, or ſhort-beaked purpura, with expanded ſpines, ranged in three ſeries (*ibid.* n° 4.)

There are a great many other ſpecies, diſtinguiſhed by the like peculiarities.

PURPURE, Pourpre, or Purple, in heraldry, according to ſome, is one of the five colours of armories, compounded of gules and azure, bordering on violet, and, according to others, of a great deal of red and a little black. But it was excluded by the antient heralds as only an imperfect colour. In the coats of noblemen it is called amethyſt; and in thoſe of princes, mercury. It is repreſented in engraving, by diagonal lines drawn from the ſiniſter chief to the dexter baſe point. See plate CCXVIII. fig. 4.

PURPURATI, in our antient hiſtorians, denotes the ſons of emperors and kings.

PURREL, a liſt ordained by act of parliament to be made at the end of kerſeys, to prevent deceit in diminiſhing their length.

PURSE, a manner of accounting, or a ſpecies of money of account, much uſed in the Levant. See the article Money.

PURSER, an officer aboard a man of war, who receives her victuals from the victualler, ſees that it be well ſtowed, and keeps an account of what he every day delivered to the ſteward. He alſo keeps a liſt of the ſhip's company, and ſets down exactly the day of each man's admiſſion, in order to regulate the quantity of proviſions to be delivered out, and that the paymaſter or treaſurer of the navy may iſſue out the diſburſements, and pay off the men, according to his book.

PURSIVENESS, among farriers, is a diſorder in horſes, otherwiſe called broken wind, in which the horſe makes a hiſſing whiſtling ſound in his throat, and has a greater heaving in the flanks than in common colds.

The cauſe of purſiveneſs proceeds from ſurfeiting, hard exerciſe upon a full belly, the horſe's being rid into water when he ſweats, and, laſtly, from obſtinate colds ill cured.

For the cure of this diſorder, Dr. Bracken adviſes, that the horſe ſhould have good nouriſhment, much corn but little hay, and that every other day the water given him be impregnated with half an ounce of ſaltpetre, and two drams of ſal armoniac.

PURSLAIN, *portulaca*, in botany, a genus of the polyandria-monogynia claſs of plants, the corolla whereof conſiſts of five plane, erect, obtuſe, emarginated petals, larger than the cup; the fruit is an oval, covered capſule, containing only one cell, and opening horizontally at the middle; the ſeeds are numerous, ſmall, and roundiſh.

This plant is cultivated in gardens for culinary uſes; the ſeeds are ranked among the leſſer cold ſeeds, and have ſometimes

ſometimes been employed in emulſions, and the like, along with others of that claſs.

PURSUIVANT, or POURSUIVANT. See the article POURSUIVANT.

PURVEYANCE and PURVEYOR. See the article POURVEYANCE.

PURVIEW, a term uſed by ſome lawyers for the body of an act of parliament, or that part which begins with, *Be it enacted, &c.* as contradiſtinguiſhed from the preamble.

PURULENT, in medicine, ſomething mixed with, or partaking of, pus or matter.

PUS, in medicine, a white or yellowiſh putrid matter, formed of corrupted blood, and contained in a wound or ulcer. See ABSCESS and SUPPURATION.

When pus is laudable and mild, it is one of the moſt powerful digeſters, ſuppurants, and incarners; when it ſtagnates too long, or when the liquors and veſſels are faulty, it may become an acrid, ſtimulating, eroding ſanies; when abſorbed in the blood, it affects all the liquors, ſtimulates the veſſels, and is capable of producing violent diſorders: for a very ſmall portion of pus abſorbed into the blood-veſſels, raiſes a putrid fever, as certainly as yeſt does a fermentation in wort.

PUSTULE, a pimple, or ſmall eruption on the ſkin full of pus; ſuch are the puſtules of the ſmall-pox and french-pox. See the article POX.

Puſtules principally break out in the ſpring, and are of various kinds; for ſometimes a kind of roughneſs ariſes all over the body, reſembling that which is produced by the application of a nettle; theſe are ſometimes red, and ſometimes they retain the natural colour of the ſkin. There are alſo puſtules of a livid, a pale, a black, or any other unnatural colour, with an humour contained in them; when they break, the ſubjacent fleſh frequently appears as if it was ulcerated.

Puſtules are ſometimes converted into ſmall ulcers, either moiſt or dry; ſometimes they are accompanied only with an itching, at other times with inflammation and pain; and a pus or ſanies, or both, are diſcharged.

In the cure of puſtules, the firſt ſtep to be taken is to uſe much exerciſe and walking; and if theſe cannot be practiſed, geſtation is the beſt ſuccedaneum. The ſecond ſtep is to diminiſh the quantity of aliments, and abſtain from all acrid and extenuating ſubſtances.

Ulcers formed from puſtules, are removed by litharge mixed with the ſeeds of fenugreek, adding oil of roſes and the juice of endive till they are of the conſiſtence of honey.

PUTANISM, whoredom, or the life or condition of a courteſan.

PUTLOGS, or PUTLOCKS, in building, a ſhort piece of timber about ſeven feet long, uſed in building ſcaffolds. They lie at right angles to the wall with one of their ends reſting upon it, and the other upon the poles which lie parallel to the ſide of the wall of the building.

PUTORIUS, the POLE-CAT, in zoology, the yellowiſh black muſtela, with a white mouth and yellow collar. See the article MUSTELA.

This creature is ſomewhat ſmaller than the Martin; the head is ſmall, oblong, pointed at the extremity, and rounded on the ſummit; the ears are ſhort, broad, patulous, and white at the edges; the eyes are large, black, and piercing in their aſpect; the mouth is wide, and well furniſhed with teeth; the neck is ſhort and thick; the body is long and ſlender; and the legs are ſhort, and not very robuſt.

PUTREFACTION, a kind of ſlow corruption produced by heat and ſome moiſt fluid, particularly the air and water; which, penetrating the pores, diſſolves and ſets at liberty ſome of the more ſubtile parts, particularly the ſalts and oils, and thus looſens the compages, and changes the texture of bodies. See the article CORRUPTION.

Putrefaction is one of the inſtruments of nature by which many great changes are brought about. If we take a quantity of freſh and green cabbage-leaves, ſays Dr. Shaw, and preſs them hard down with weights in an open tub bored full of holes on the ſides, and ſet in a warm place; by ſtanding in this ſtate for ſome days, the leaves conceive a heat in the middle, which ſpreads to the external parts, till at length nearly the whole is converted into a pappy ſubſtance reſembling putrified fleſh, which on being diſtilled in a glaſs-retort, affords the ſame kind of volatile ſalt and oil, as if it had been an animal ſubſtance. This experiment ſucceeds alike in all tender, juicy, vegetable ſubjects: ſo that both the acid and alkaline tribe of plants, the ſweet and the bitter, the aſtringent and emollient, &c. reſolve into the ſame pappy putrid ſubſtance.

Hence we fee the way employed by nature for changing all vegetable into animal fubftances, or of reducing the matters of both kingdoms into a fimilarity. Thus if any large animal body, as that of a horfe, or dog, for example, be expofed in a dead ftate to the open air and the fummer's fun, it in a few days begins to fwell, purge, and emit a naufeous ftench: at length the carcafe is deftroyed by the commotion, and refolved into a putrid, fetid, ftercoraceous matter: a large part, in the mean time, flying off into the air, fo as to leave but a fmall proportion of a mucilaginous pappy fubftance, which foon grows dry, or turns to a kind of earth. This experiment is univerfal, and holds equally of birds, beafts, and fifhes. Whence rivers, the ocean, and the atmofphere itfelf muft be neceffarily impregnated with fermenting, putrefying, and putrefied particles; which are mixed with other matters and difperfed through the immenfe bodies of thofe fluids, in which they undergo fuch changes, whether by uniting with the falts of the air and ocean, or otherwife, as not ordinarily to prove deftructive or noxious to the creatures that inhabit thofe elements. But by the very means by which bodies are diffolved, and reduced to their firft principles, they are ftill kept in being. With regard to medicine, we know that neither animal nor vegetable fubftances can become aliment without undergoing fome degree of putrefaction. Many diftempers proceed from a deficiency of this action. The crifis of fevers feems to depend upon it, and even animal heat, according to Dr. Stevenfon, does the fame.

Now that the concoction of the humours is nothing elfe but putrefaction, fays Dr. Pringle, in his Obfervations on the difeafes of the army, feems probable from hence, that whenever they are in that ftate, they are always more fluid, and fitter to pafs through the fmaller veffels, where they ftagnated before. The offenfivenefs of the fweats, or other excretions confequent on a crifis, is alfo a fure fign of a high degree of corruption. The time of refolution or putrefaction depends on the degree of heat, the habit of the patient, and on the part obftructed. Refolution is the putrefaction of the empacted humour only, but fuppuration implies a corruption of the veffels alfo. This manner of fpeaking, indeed, has been difufed, from the prejudices that nothing was putrid but what was offenfively fo; whereas, in fact, every fibre becoming more tender, and humour thinner, may be confidered as in fome degree putrid, whether the change tends to the better health, or the deftruction of the perfon, or whether it becomes grateful or offenfive to the fenfes.

As all the humours of animal bodies become thinner by putrefaction, fo the folid or fibrous parts are thereby relaxed and rendered more tender; and hence the extraordinary bulk of the heart, liver, and fpleen, incident to perfons labouring under putrid difeafes, may be accounted for. It is remarkable, that in diffections of people who die of the plague, the heart is almoft always found of an uncommon bignefs; and as to the fcurvy, the liver and fpleen are fometimes enlarged to fuch a degree, as to be feen outwardly.

Putrefaction is always found to generate air. Hence though flefh as well as blood be fpecifically heavier than water, yet dead bodies are found to float, after lying fome time at the bottom, from air generated in the bowels by putrefaction.

The differences between putrefaction and fermentation, according to Boerhaave, are thefe: 1. A greater groffnefs, compreffion and denfity feems required in putrefaction, then in the fermentation of vegetables. 2. Putrefaction acts upon all vegetables whatfoever, provided they be foft and juicy; but fermentation only upon fome, and not upon others. 3. The heat required in putrefaction, fpontaneoufly rifes from the degree of an healthy human body, even to that of a violent flame; but in fermentation, if the degree of heat rifes up to that of an healthy body, the fermenting caufe is diffipated, and the liquor turned vapid; for the heat generated by fermentation is not greater than that of feventy-five degrees, except in the fermentation of vinegar, and even there, unlefs the heat be immediately ftopped, no vinegar, but a corrupt vapid liquor will be obtained. 4. Putrefaction renders all the faline matters volatile and alkaline, the oils fetid and volatile, and almoft volatilizes the earth itfelf; but fermentation makes acids volatile and fubtile, and contrary to alkalies, fpirituous, gratefully odorous and inflammable; and it generates an acid tartar, that leaves an alkaline matter as fixed in the fire, as the fubject would have done before. 5. The falts that

that by putrefaction are of the same simple, alkaline, fetid volatile nature, are by fermentation acid, in a great measure fixed, and compounded of spirit, oil and earth. And, 6. Putrefaction is a means of intirely converting all the saline vegetable matters into one and the same simple volatile alkali; but fermentation converts only a small part of the saline matter of vegetables, into a liquid, volatile acid, leaving the rest almost unchanged.

PUTRID, something rotten, or putrified. See the article PUTREFACTION.

Thus a putrid fever, is a fever in which the humours, or part of them, are become putrefied, as in malignant fevers. See the article MALIGNANT.

PUTTOCKS, or PUTTOCK *shrouds*, in a ship, are small shrouds which go from the shrouds of the main-mast, fore-mast, and mizen-mast, to the top-mast shrouds; and if there be any top-gallant masts, there are puttocks to go from the top-mast shrouds into these. These puttocks are at the bottom seized to a staff, or to some rope which is seized to a plate of iron, or to a dead man's eyes, to which the lanniards of the fore-mast shrouds do come.

PUTTY, the same with spodium. See the article SPODIUM.

PUTTY, in its popular sense, is a kind of paste compounded of whiting and linseed oil, beaten together to the consistence of thick dough.

It is used by glaziers for the fastening in the squares of glass in sash-windows, and by painters for stopping up the crevices and clefts in timber and wainscots, &c.

PUTTY, sometimes also denotes the powder of calcined tin, used in polishing and giving the last gloss to works of iron and steel.

PUTURA, a custom claimed by the keepers of forests, and sometimes by bailiffs of hundreds, to take man's meat, horse's meat, and dog's meat, of the tenants and inhabitants gratis, within the perambulation of the forest, or liberty of the hundred.

The land subject to this custom is called terra putura.

PYANEPSIA, in antiquity, an athenian festival celebrated on the seventh day of the month pyanepsion; which, according to the generality of critics, was the same as our september.

Plutarch refers the institution of this feast to Theseus, who after the funeral of his father, on this day paid his vows to Apollo, because the youths who returned with him safe from Crete then made their entry into the city. On this occasion these young men putting all that was left of their provisions into one kettle, feasted together on it, and made great rejoicing. Hence was derived the custom of boiling pulse on this festival. The Athenians likewise carried about an olive branch, bound about with wool, and crowned with all sorts of first fruits, to signify that scarcity and barrenness were ceased, singing in procession a song. And when the solemnity was over, it was usual to erect the olive-branch before their doors, as a preservative against scarcity and want.

PYCNOSTYLE, in the antient architecture, is a building where the columns stand very close to each other; only one diameter and a half of the column being allowed for the intercolumniations.

According to Mr. Evelyn, the pycnostyle chiefly belonged to the composite order, and was used in the most magnificent buildings; as at present in the peristyle at St. Peter's at Rome, which consists of near three hundred columns; and in such as yet remain of the antients, among the late discovered ruins of Palmyra.

PYCNOTICS, the same with incrassants. See the article INCRASSATING.

PYE, or SEA-PYE, *hæmatopus*. See the article HÆMATOPUS.

PYGARGUS, in ornithology, the falco with a yellow cera, and with the tail-feathers white and black at the end. See the article FALCO.

PYGME, the same with cubit. See the article CUBIT.

PYGMY, a person not exceeding a cubit in height.

This appellation is given by the antients to a fabulous nation said to have inhabited Thrace; who brought forth young at five years of age, and were old at eight; these were famous for the bloody war they waged with the cranes.

PYLORUS, in anatomy, the right or lower orifice of the stomach, which is connected with and opens into the intestines. See the articles STOMACH and INTESTINES.

PYONY, or PIONY. See PIONY.

PYRAMID, πυραμις, in geometry, a solid standing on a triangular, square, or polygonal basis, and terminating in a point at the top; or, according to Euclid, it is a solid figure, consisting of several

veral triangles, whose bases are all in the same plane and have one common vertex. See plate CCXXI. fig. 2. n° 1, 2, 3.

Hence the superficies of a given pyramid is easily found by measuring these triangles separately; for their sum added to the area of the base, is the surface of the pyramid required.

It is no less easy to find the solid content of a given pyramid; for the area of the base being found, let it be multiplied by the third part of the height of the pyramid, or the third part of the base by the height, and the product will give the solid content, as is demonstrated by Euclid, lib. 12. prop. 7.

If the solid content of a frustum of a pyramid is required, first let the solid content of the whole pyramid be found; from which substract the solid content of the part that is wanting, and the solid content of the frustum, or broken pyramid, will remain. See FRUSTUM.

Every pyramid is equal to one third of its circumscribing prism, or that has the same base and height; that is, the solid content of the prism A B D (*ibid.* n° 2.) is equal to one third of the prism A B F E. For supposing the base A *a* B *b* a square, then does the pyramid consist of an infinite number of such squares, whose sides or roots are continually increasing in arithmetical progression, beginning at the vertex or point D; its base, A *a* B *b*, being the greatest term, and its perpendicular height, C D, the number of all the terms: but the last term multiplied into the number of terms will be triple the sum of all the series, or $\frac{NLL}{3} = S$ = the solid content of the pyramid.

All pyramids are in a ratio compounded of their bases and altitudes; so that, if their bases be equal, they are in proportion to their altitudes; and vice versa.

Equal pyramids reciprocate their bases and altitudes; that is, the altitude of one is to that of the other, as the base of the one is to that of the other.

PYRAMID, in architecture, a solid massive building, which from a square, triangular, or other base, rises diminishing to a vertex or point.

Pyramids are sometimes used to preserve the memory of singular events; and sometimes to transmit to posterity the glory and magnificence of princes. But as they are esteemed a symbol of immortality, they are most commonly used as funeral monuments. Such is that of Cestius at Rome, and those other celebrated ones of Egypt, as famous for the enormity of their size, as their antiquity. These are situated on the west side of the Nile almost opposite to Grand Cairo; the base of the largest covers more than ten acres of ground, and is, according to some, near seven hundred feet high, tho' others make it but six hundred, and some but little more than five hundred. The pyramid is said to have been, among the Egyptians, a symbol of human life; the beginning of which is represented by the base, and the end, by the apex; on which account it was, that they used to erect them over sepulchres.

PYRAMIDAL, something relating to a pyramid. See the preceding article.

PYRAMIDAL NUMBERS. See NUMBER.

PYRAMIDALES *papillæ*. See the article PAPILLA.

PYRAMIDALIA CORPORA, in anatomy, the two protuberances of the medulla oblongata. The spermatic vessels are also by some authors thus termed.

PYRAMIDALIS, in anatomy, a small muscle in the abdomen lying in the lower part of the rectus. It has its name from its figure, and its origin from the margin of the os pubis, with a broad fleshy head, whence it grows gradually narrower, till it ends in a small round tendon in the linea alba, sometimes almost at the navel. This muscle is sometimes single, sometimes it has its fellow, and in some subjects they are both wanting.

Pyramidalis is also the name of one of the dilatores, or muscles which serve to turn up the nose. This muscle rises at the foot of the nose, and is usually continuous with the frontalis. It descends along the side of the nose, where it is by degrees a little expanded. It is inserted into the alæ of the nose, and often sends down its fibres as far as to the upper-lip.

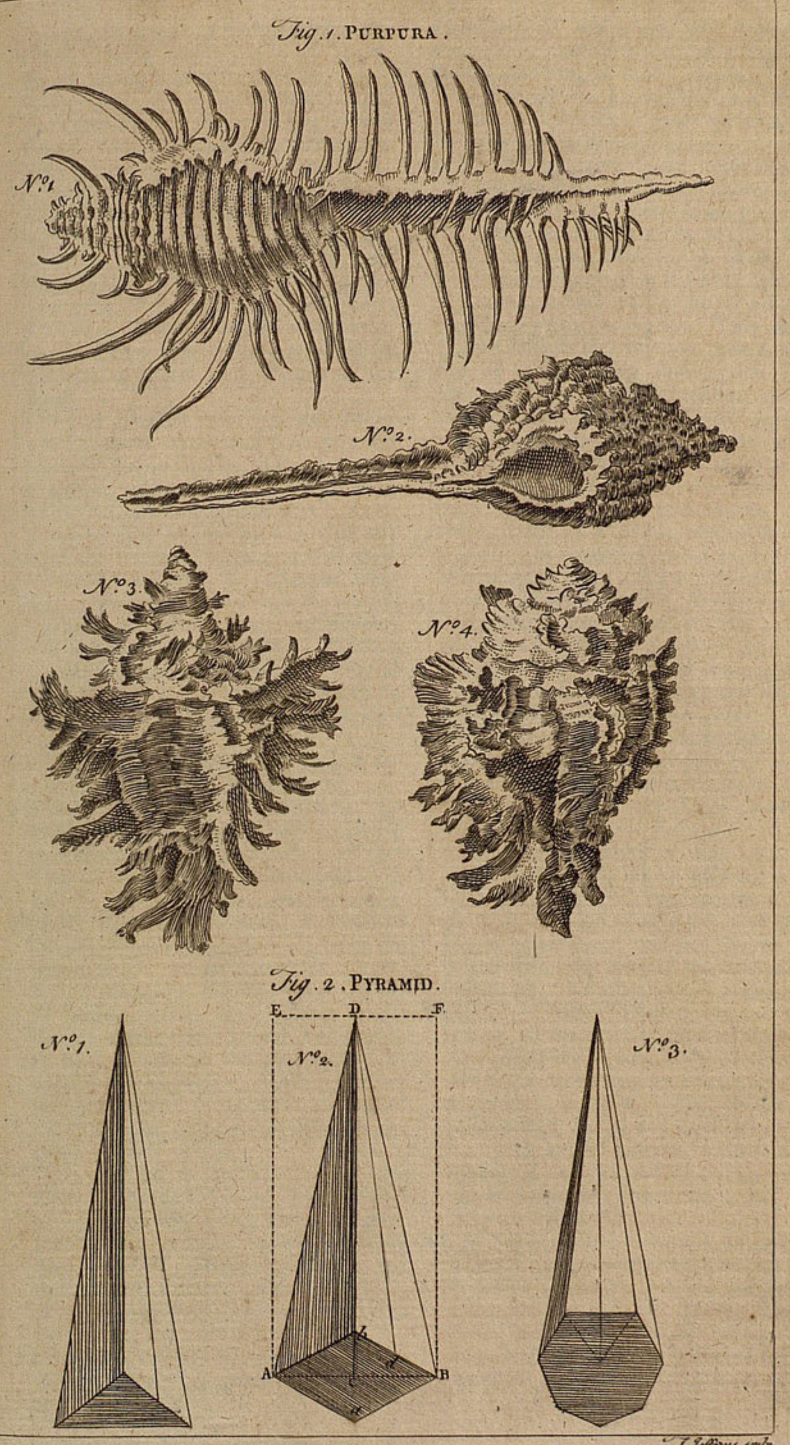
PYRAMIDOID, the same with the parabolic spindle. See the article PARABOLIC.

PYRATE. See the article PIRATE.

PYRENEAN MOUNTAINS divide France from Spain, and are not inferior to the Alps in height: they extend from the Mediterranean to the ocean, upwards of two hundred miles in length; the greatest breadth being about one hundred and twenty.

PYRENOIDES PROCESSUS, in anatomy, a process of the second vertebra of the neck, called also odontoides, and dentiformis.

PYRETHRUM, in the materia medica,



J. Jefferys sculp.

the root of a ſpecies of the buphthalmum, called, among us, pellitory of Spain. See the article BUPHTHALMUM.

The pyrethrum is a ſmall and firm root, about two or three inches in length, and from a quarter of an inch to a little more in diameter; its ſurface is very much corrugated; it is of a duſky brown colour on the outſide, and appears whitiſh within. It is to be choſen in the largeſt and perfecteſt pieces, ſound and firm, and not brittle nor duſty. The eaſtern nations uſe a great deal of this root, and ſend it to Cairo, Conſtantinople, and other places, where it is eſteemed an excellent medicine in colics and diſeaſes of the breaſt.

There is another kind of pyrethrum which is more uncommon here than the former: this is ſmaller, ſlenderer, and of a paler colour, and is the root of a ſpecies of the Chryſanthemum. Pyrethrum of either of theſe kinds is violently acrid and pungent, whence it is of great ſervice in the tooth ach, and other diſorders of the head. It vellicates the nerves, and aſſiſts in opening their obſtructions, and hence is given in ſleepy diſeaſes, apoplexies, lethargies, and in palſies of the tongue. It is ſometimes added to clyſters given in apoplectic and lethargic caſes.

PYRETICS, medicines good againſt fevers. See FEVER and FEBRIFUGE.

PYRICUBIUM, in natural hiſtory, the name of a genus of foſſil bodies, uſually comprehended, with many others of very different figures and ſtructures, under the general name of pyrites. See PYRITES.

PYRIFORMIS, in anatomy, a muſcle of the thigh, receiving its name from its figure, which reſembles that of a pear. It riſes thick from the lower part of the os ſacrum, where it is joined to the ileum; from thence it runs tranſverſely towards the joint of the hip, and terminates in a ſhort tendon, which is inſerted in the middle of the internal labium of the upper edge of the great trochanter, by two or three branches.

PYRIPLACIS, in natural hiſtory, the name of a genus of pyrites, the characters of which are theſe: they are compound, inflammable, metallic bodies, found in looſe detached maſſes, of a ſimple and uniform, not ſtriated, internal ſtructure, and are covered with an inveſtient coat or cruſt. See the article PYRITES.

PYRIPOLYGONIUM, in natural hiſtory, the name of a genus of foſſils, the characters of which are, that they are compound, metallic bodies, of a regular figure, conſiſting of twelve planes.

There is only one known ſpecies of this genus, tho' ſubject to great varieties in its appearance; and this has been by authors hitherto confounded, with many other bodies of a very different nature and figure, under the general name pyrites.

PYRITES, or PYRITÆ, in natural hiſtory, a name uſed for a claſs of compound inflammable metallic bodies found in detached maſſes, but of no determinately angular figure. This claſs Doctor Hill divides into two orders, the firſt of which, being thoſe pyritæ of a plain and ſimple internal ſtructure, comprehends two genera: the firſt genus, termed pyriplaces, are thoſe pyritæ of a ſimple internal ſtructure, and covered with an inveſtient coat or cruſt; the ſecond genus, termed gymnopyres, are thoſe pyritæ of a ſimple internal ſtructure, and not covered with a cruſt; the ſecond order being thoſe pyritæ of a regularly ſtriated internal ſtructure alſo comprehends two genera, the firſt termed pyritricha are thoſe pyritæ of a ſimple ſtriated texture; the ſecond genus called pyritrichiphylla are thoſe pyritæ whoſe ſtriæ terminate in foliaceous ends.

This foſſile is recommended by ſome authors as an emmenagogue, but it is ſcarce ever preſcribed with this intention; the common green vitriol, or copperas of the ſhops, is made from it; and an acid ſomewhat different from that of pure vitriol may be drawn off from it by the retort, after it has been expoſed to the air till it moulders away: this is of great uſe in mineralogy, and is a ſolvent for ſeveral foſſils that none of the other acids will touch. See the article VITRIOL.

PYRITRICHIPHYLLUM, in natural hiſtory, the name of a genus of foſſils of the claſs of the pyrites, the characters of which are theſe: they are compound, inflammable, metallic bodies, found in looſe maſſes, not of any regularly angular figure, and of a ſtriated texture, with foliaceous ends to the ſtriæ, appearing on the ſurface or within the maſs. See the article PYRITES.

PYRITRICHUM, in natural hiſtory, the name of a genus of pyrites, the characters of which are theſe: they are compound, inflammable, metallic foſſils, always found in detached maſſes of no regularly angular figure, and of a ſimple ſtriated ſtructure. See the article PYRITES.

PYRMONT, the capital of a county of that name in the circle of Weftphalia in Germany, fituated on the confines of the dutchy of Brunfwic, in eaft long. 9°, north lat. 52°, from whence we receive the beft mineral waters in Germany.

The country all about where thefe fprings are, abound with materials which give virtue to the waters, and the quarries of ftone wherever they are dug fend up fpirituous and martial exhalations, as well as the fprings that run from them; and the water in general has a vitriolic tafte. Hoffman obferves, that thefe waters contain a volatile and fubtile principle greatly more penetrating and ftrong, as well as in larger quantities, than any other mineral water; but that this is not to be expected in them any where but upon the fpot, for thofe who tranfport them to other places, are conftrained to let a part of this fly off to preferve the reft. If either glafs or earthen veffels be filled at the fpring, and immediately corked or faftened down, the confequence is, that they will burft on the firft motion, or heat of the weather. They are therefore forced to fill them only in part firft, and let them ftand a while for this fubtile fpirit to exhale; and then a while after filling them up, to cork and fit them for carriage. If they are drank on the fpot in a morning upon an empty ftomach, they affect the nofe with a pungent tingling, and difturb the head for many hours afterwards. If they are taken at the fpring, they purge but very little; but if taken in another place after tranfportation they purge confiderably more, and render the ftools black. It is obfervable alfo, that if they are left in an open veffel a few days, their virtue wholly exhales, and they no longer purge. If tea-leaves, balauftine-flowers, or galls, are put into this water, they firft change it to a blue, from that to a purple, and finally into a black; a little fpirit of vitriol added to this liquor renders it as limpid as before. If any acid be mixed with this water there is raifed an effervefcence, and bubbles of air are carried up in great quantity. If any alkaline liquor be added, there is no ebullition raifed, but the liquor becomes turbid and milky; and the fpirit of vitriol added to this renders it limpid again, &c. It appears upon the whole, that the pyrmont-waters poffefs a pure extremely penetrating and elaftic mineral fpirit, and that in a very large proportion; and to this their virtues are to be principally attributed.

The great quantity of this powerful fpirit, contained in the waters, makes them more fit for the robuft and ftrong conftitutions, when depraved by illnefs, than for the weak and tender ones; but even the tendereft people may take them, only by obferving to take but a fmall dofe, or to dilute them with an equal quantity of common water immediately before taking them. They are of great efficacy in ftrengthening the tone of the vifcera, opening obftructions, and ftimulating in a proper manner the excretory ducts, fo as to make them duly perform their office: and Hoffman, on his own experience, recommends them, mixed with equal quantities of milk, as good in fcorbutic and gouty cafes.

For the imitation of pyrmont-water, or making it artificially, fo that it will not only refemble the natural, but will have the fame effect as a medicine, fee the article MINERAL *Waters*.

PYROCTOGONIUM, in natural hiftory, the name given by Dr. Hill to a genus of foffils comprehended by authors, with many others, under the general name pyrites. See the article PYRITES.

PYROLA, WINTER-GREEN, in botany, a genus of the decandria-monogynia clafs of plants, the corolla whereof confifts of five roundifh, hollow, patent petals; the fruit is a roundifh, depreffed, pentagonal capfule, containing five cells, and opening at the angles; the feeds are numerous, very fmall, and paleaceous. See plate CCXXV. fig. 4.

In medicine, this plant has the credit of being efteemed for its refrigerating, deficcative, aftringent, and confolidating virtues; and it is very noted as a vulnerary, whether ufed internally or externally.

PYROMANCY, πυρομαντεία, a kind of divination by means of fire. The antients imagined they could foretel future events, by infpecting fire and flame; and to this end, they confidered its direction, which way it turned: fometimes they added other matters to the fire, fuch as a veffel full of urine, having its neck bound about with wool, watching narrowly on which fide it burft, and thence taking their augury: fometimes they threw pitch on it; and, if it took fire immediately, they efteemed it a good augury.

PYROTECHNY, πυροτεχνία, the art of fire, or a fcience which teaches the management

nagement and application of fire, in several operations. Pyrotechny is of two kinds, military and chemical: military pyrotechny is the doctrine of artificial fire-works and fire arms, teaching the structure and use of those used in war, the attacking of fortifications, &c. as gun-powder, cannons, bombs, granadoes, carcasses, mines, fusees, &c. and those made for amusement's sake, as rockets, stars, serpents, &c. See the article GUN-POWDER, CANNON, &c.

Chemical pyrotechny is the art of managing and applying fire in distillations, calcinations, and other operations of chemistry. See FIRE, DISTILLATION, &c.

PYROTICS, πυρωτικα, in medicine, caustics, or remedies, either actually or potentially hot; and which accordingly will burn the flesh, and raise an eschar. See the article CAUSTICS.

PYRRHICHA, πυῤῥιχη, in antiquity, a kind of exercise on horseback, or a feigned combat, for the exercise of the cavalry.

PYRRHICHIUS, in the greek and latin poetry, a foot consisting of two syllables, both short, as *deus*. See FOOT.

PYRRHONIANS, PYRRHONEANS, or PYRRHONISTS, a sect of antient philosophers, so called from Pyrrho, a native of Elis, in Peloponnesus. The opinions of these philosophers, who were also called sceptics, terminated in the incomprehensibility of all things, in which they found reason both for affirming and denying; accordingly they seemed, during their whole lives, to be in search of truth, without ever acknowledging that they had found it: hence the art of disputing upon all things, without ever going farther than suspending our judgment, is called pyrrhonism.

Pyrrho maintained, that life and death were equally indifferent; and he is charged with teaching, that honour and infamy, the justice and injustice of actions, depended solely on human laws and customs; and in a word, that there is nothing in itself honest or dishonest, just or unjust: an abominable doctrine, that opens the way to all manner of crimes.

PYRUS, the PEAR-TREE, in botany, a genus of the icosandria-pentagynia class of plants, the corolla whereof consists of five roundish concave petals, inserted into the calyx; the fruit is an umbilicated apple, of a figure approaching to round, fleshy, and containing five cells, formed by membranes: the seeds are oblong, obtuse, acuminated at the base, convex on one side, and plane on the other.

Under this genus is comprehended the apple and the quince-tree.

The fruit of this plant is refrigerating, astringent, &c.

PYTHAGOREANS, a sect of antient philosophers, so denominated from their being the followers of Pythagoras of Samos, who lived in the reign of Tarquin, the last king of the Romans, in the year of Rome 220; or, according to Livy, in the reign of Servius Tullius, in the year of the world 3472.

Pythagoras, from his extraordinary desire of knowledge, travelled in order to enrich his mind with the learning of the several countries through which he passed. He was the first who took the name of philosopher, that is, a lover of wisdom, which implied, that he did not ascribe the possession of wisdom to himself, but only the desire of possessing it.

His maxims of morality were admirable; for he was for having the study of philosophy solely tend to elevate man to a resemblance of the Deity. He believed that God is a soul diffused through all nature, and that from him human souls are derived; that they are immortal, and that men need only take pains to purge themselves of their vices, in order to be united to the Deity. He made unity the principle of all things; and believed, that between God and man there are various orders of spiritual beings, who are the ministers of the supreme being. He condemned all images of the Deity, and would have him worshipped with as few ceremonies as possible. His disciples brought all their goods into a common stock, contemned the pleasures of sense, abstained from swearing, eat nothing that had life, and believed in the doctrine of a metempsychosis. See the article METEMPSYCHOSIS.

Pythagoras made his scholars undergo a severe noviciate of silence for at least two years; and it is said, that where he discerned too great an itch for talking, he extended it to five: his disciples were therefore divided into two classes, of which the first were simple hearers, and the last such as were allowed to propose their difficulties, and learn the reasons of all that was taught there. The pythagoreans, it is said, on their rising from bed, roused the mind with the sound of the lyre, in order to make them more fit for the actions of the day; and at night re-

sumed the lyre, in order to prepare themselves for sleep, by calming all their tumultuous thoughts. The figurative manner in which he gave his instructions, was borrowed from the Hebrews, Egyptians, and other orientals. Some think he derived his philosophy from the books of Moses, and that he conversed with Ezekiel and Daniel at Babylon; but this is mere conjecture.

Some authors say, that he left nothing in writing; but Laërtius and others attribute several treatises to him. His golden verses, attributed by some to one of his disciples, are allowed to be an exact copy of the sentiments of that divine philosopher, from whose school proceeded the greatest philosophers and legislators.

PYTHEUMA, in botany, a plant of the pentandria-monogynia class, with a monopetalous flower, divided into five linear segments, disposed star-ways; the fruit is a roundish trilocular capsule, containing a great many small and roundish seeds.

PYTHIA, in antiquity, the priestess of Apollo at Delphi, by whom he delivered oracles: she was thus called from the god himself, who was denominated Apollo Pythios, from his slaying the serpent Python.

This priestess was to be a pure virgin; she sat on the lid of a brazen vessel, mounted on a tripod or three-legged stool; and thence, after a violent enthusiasm, delivered her oracles in a few ambiguous and obscure verses, or in a short sentence in prose. See ORACLE.

PYTHIAN GAMES, in antiquity, solemn games celebrated near Delphi, in honour of Apollo, and in remembrance of his having killed the serpent Python.

These were held every two years, about the month Elaphebolion, which answered to our February. The celebration of these games was attended with the pythian song, in which was celebrated the fight of Apollo and the serpent. The victors were crowned with branches of laurel; tho', at the first institution, the crown was of beech-leaves. See GAMES.

PYXIDIUM, CUP-MOSS, in botany, a genus of mosses, consisting of a firm, tough, and flexile matter, formed into the shape of hollowed cups, or drinking glasses, with longer or shorter stems.

PYXIS NAUTICA, the SEAMAN'S COMPASS. See the article COMPASS.

PYXIS, in anatomy, the acetabulum, or cavity of the hip-bone. See the articles ACETABULUM and FEMUR.

Q.

Q, or q, the sixteenth letter, and twelfth consonant, of our alphabet; but is not to be found either in the greek, old latin, or saxon alphabets; and indeed some would entirely exclude it, pretending that k ought to be used wherever this occurs: however, as it is formed in the voice in a different manner, it is undoubtedly a distinct letter; for in expressing this sound the cheeks are contracted, and the lips, particularly the under one, are put into a cannular form, for the passage of the breath.

The q is never sounded alone, but in conjunction with u, as in *quality*, *question*, *quite*, *quote*, &c. and never ends any english word.

As a numeral, Q stands for 500; and with a dash over it, thus $\bar{Q}$, for 500000.

Used as an abbreviature, q. signifies quantity, or quantum: thus, among physicians, q. pl. is quantum placet, *i. e.* as much as you please of a thing; and q. s. quantum sufficit, *i. e.* as much as is necessary. Q. E. D. among mathematicians, is quod erat demonstrandum, *i. e.* which was to be demonstrated; and Q. E. F. quod erat faciendum, *i. e.* which was to be done. Q. D. among grammarians, is quasi dictum, *i. e.* as if it were said, or, as who should say. In the notes of the antients, Q. stands for Quintus, or Quintius; Q. B. V. for quod bene vertat; Q. S. S. S. for quæ supra scripta sunt; Q. M. for Quintus Mutius, or quomodo; Quint. for Quintilius; and Quæs. for quæstor.

QUACK, among physicians, the same with empiric. See the article EMPIRIC.

QUADRA, in building, any square bordure, or frame, encompassing a basso relievo, pannel, painting, or other work: it is also used, but erroneously, for a frame or bordure, of any other form, as round, oval, or the like.

QUADRAGESIMA, a denomination given

given to lent, from its confifting of forty days. See the article LENT.

Hence alfo the firft Sunday of lent is called Quadragefima-funday, and the three preceding Sundays, Quinquagefima, Sexagefima, and Septuagefima.

QUADRANGLE, in geometry, the fame with a quadrilateral figure, or one confifting of four fides and four angles. See the article QUADRILATERAL.

QUADRANS, the quarter or fourth part of any thing, particularly the *as*, or pound. See the article As.

QUADRANT, *quadrans*, in geometry, an arch of a circle, containing 90°, or the fourth part of the entire periphery. See the articles CIRCLE and DEGREE.

Sometimes alfo the fpace, or area, included between this arch and two radii drawn from the center to each extremity thereof, is called a quadrant, or, more properly, a qudrantal fpace, as being a quarter of an entire circle.

QUADRANT alfo denotes a mathematical inftrument, of great ufe in aftronomy and navigation, for taking the altitudes of the fun and ftars, as alfo for taking angles in furveying, *&c.*

This inftrument is varioufly contrived, and furnifhed with different apparatus, according to the various ufes it is intended for; but they all have this in common, that they confift of a quarter of a circle, whofe limb is divided into 90°. Some have a plummet fufpended from the center, and are furnifhed with fights to look through.

The principal and moft ufeful quadrants are the common furveying quadrant, aftronomical quadrant, Adam's quadrant, Cole's quadrant, Davis's quadrant, Gunter's quadrant, Hadley's quadrant, horodictical quadrant, Sutton's or Collin's quadrant, and the finical quadrant, *&c.* of each of which in order.

1. The common furveying quadrant, ABC (pl. CCXXII. fig. 1. n° 1. is made of brafs, wood, or any other folid fubftance; the limb of which BC, is divided into 90°, and each of thefe farther divided into as many equal parts as the fpace will allow, either diagonally or otherwife. On one of the femi-diameters AC, are fitted two moveable fights; and to the center is fometimes alfo fixed a label, or moveable index AD, bearing two other fights; but in lieu of thefe laft fights there is fometimes fitted a telefcope: alfo from the center there is hung a thread with a plummet; and on the under fide, or face of the inftrument is fitted a ball and focket, by means of which it may be put into any pofition. The general ufe of it is for taking angles in a vertical plane, comprehended under right lines going from the center of the inftrument, one of which is horizontal, and the other is directed to fome vifible point. But befides the parts already defcribed, there is frequently added on the face near the center, a kind of compartment, E F, called the quadrat, or geometrical fquare; which is divided as in the figure, and will be farther defcribed under the article QUADRAT.

This quadrant may be ufed in different fituations: for obferving heights or depths, its plane muft be difpofed perpendicularly to the horizon; but to take horizontal diftances, its plane is difpofed parallel thereto: again, heights and diftances may be taken two ways, *viz.* by means of the fixed fights and plummet, or by the label.

As to the manner of meafuring angles by this quadrant: Let there be an angle in a vertical plane, comprehended between a line parallel to the horizon HK and the right line RA, (*ibid.* n° 2.) coming from the fun, moon, a ftar, or any remarkable point of a tower, or hill: now to meafure this angle RAH by the quadrant, let the inftrument be placed in the vertical plane, fo as that its center A may be in the angular point, and let the fights on the fide CA be directed towards the object at R; then the degrees and minutes in the arch BD, cut off by the plummet or perpendicular, AD, will meafure the angle RAH: for, from the make of the quadrant, BAC is a right angle; therefore BAR is likewife a right angle, being equal to it. But, becaufe HK is horizontal, and AD perpendicular to the horizon, HAD will be a right angle; and therefore BAR = HAD, and BAR − HAB = HAD − HAB, or RAH = BAD: but the arch BD is the meafure of the angle BAD, confequently it is likewife the meafure of RAH. *Q. E. D.*

The remaining arch on the quadrant, DC, is the meafure of the angle RAZ, comprehended between the forefaid right line, RA, and AZ which points to the zenith; fo that the arch DC meafures, or is equal to the zenith diftance = ∠RAZ.

For the farther ufe of this inftrument, in meafuring heights and diftances, as alfo for taking angles like a graphometer.

ter. See the articles HEIGHT, GRAPHOMETER, SURVEYING, &c.

2. The aſtronomical quadrant is a large one uſually made of braſs, or wooden bars faced with iron-plates; having its limb, F E, (pl. CCXXII. fig. 2.) nicely divided either diagonally, or otherwiſe, into degrees, minutes, and ſeconds; and furniſhed with two teleſcopes, one fixed on the ſide of the quadrant, at A B; and the other C D, moveable about the center, by means of the ſcrew, G. The dented wheels, (I, H,) ſerve to direct the inſtrument to any object, or phænomenon.

The uſe of this curious inſtrument, in taking obſervations of the ſun, planets, and fixed ſtars is obvious; for being turned horizontally upon its axis, by means of the teleſcope A B, till the object is ſeen through the removeable teleſcope; then the degrees, &c. cut by the index, give the altitude required.

3. Adams's quadrant differs only from Cole's quadrant, in having an horizontal vane, with the upper part of the limb lengthened; ſo that the glaſs, which caſts the ſolar ſpot on the horizon-vane, is at the ſame diſtance from the horizon-vane as the ſight-vane at the end of the index.

4. Cole's quadrant is a very uſeful inſtrument invented by Mr. Benjamin Cole: it conſiſts of ſix parts, *viz.* the ſtaff A B (pl. CCXXII. fig. 3.) the quadrantal-arch D E; three vanes A, B, C; and the vernier, F G.

The ſtaff is a bar of wood about two feet long, an inch and a quarter broad, and of a ſufficient thickneſs to prevent it from bending or warping. The quadrantal arch is alſo of wood, being nearly equal in ſtrength to the ſmall arch of Davis's quadrant, and is divided into degrees, and third parts of a degree, to a radius of about nine inches; to its extremities are fixed two radii, which meet in the center of the quadrant by a pin, round which it eaſily moves. The ſight-vane A is a thin piece of braſs almoſt two inches in height, and one broad, placed perpendicularly on the end of the ſtaff A, by the help of two ſcrews paſſing through its foot. Through the middle of this vane is drilled a ſmall hole, like that in the ſight vane of Davis's quadrant, through which the coincidence or meeting of the horizon and ſolar ſpot is to be viewed. The horizon-vane B is about an inch broad, and two inches and a half high, having a ſlit cut through it of near an inch long, and a quarter of an inch broad; this vane is fixed in the center-pin of the inſtrument, in a perpendicular poſition, by the help of two ſcrews paſſing through its foot, whereby its poſition, with reſpect to the ſight-vane, is always the ſame; their angle of inclinations being equal to forty-five degrees. The ſhade-vane C is compoſed of two braſs plates; the one, which ſerves as an arm, is about four inches and a half long, and three quarters of an inch broad, being pinned, at one end, to the upper limb of the quadrant by a ſcrew, about which it has a ſmall motion; the other end lies in the arch, and the lower edge of the arm is directed to the middle of the center-pin: the other plate, which is properly the vane, is about two inches long, being fixed perpendicularly to the other plate, at about half an inch diſtance from that end next the arch; this vane may be uſed either by its ſhade, or by the ſolar ſpot caſt by a convex lens placed therein. And, becauſe the wood-work is often apt to warp or twiſt, therefore this vane may be rectified by the help of a ſcrew, ſo that the warping of the inſtrument may occaſion no error in the obſervation, which is performed in the following manner: ſet the line G on the vernier againſt a degree on the upper limb of the quadrant, and turn the ſcrew on the backſide of the limb forward or backward, till the hole in the ſight-vane, the center of the glaſs, and the ſunk ſpot in the horizon-vane, lie in a right-line.

To find the ſun's altitude by this inſtrument: turn your back to the ſun, holding the inſtrument by the ſtaff, with your right hand, ſo that it be in a vertical plane paſſing through the ſun; apply your eye to the ſight-vane, looking through that and the horizon-vane till you ſee the horizon; with the left hand ſlide the quadrantal arch upwards, until the ſolar ſpot or ſhade, caſt by the ſhade-vane, fall directly on the ſpot or ſlit in the horizon-vane; then will that part of the quadrantal arch, which is raiſed above G or S (according as the obſervation reſpected either the ſolar ſpot or ſhade) ſhew the altitude of the ſun at that time. But, if the meridian altitude be required, the obſervation muſt be continued, and, as the ſun approaches the meridian, the ſea will appear through the horizon-vane, and then is the obſervation finiſhed; and the degrees and minutes counted as before, will give

give the ſun's meridian altitude: or the degrees counted from the lower limb upwards will give the zenith-diſtance.

5. Davis's quadrant, ſo called from its inventor captain Davis, has already been deſcribed under the arttcle BACK-STAFF. This inſtrument has got the name of back-ſtaff, becauſe the obſerver's back is turned towards the ſun, in taking its altitude: it is alſo called, eſpecially among foreigners, the engliſh quadrant.

6. Gunter's quadrant, ſo called from its inventor Edmund Gunter, is repreſented in plate CCXXII. fig. 4; and beſides the apparatus of other quadrants, has a ſtereographical projection of the ſphere on the plane of the equinoctial. It has alſo a calendar of the months, next to the diviſions of the limb.

Uſe of Gunter's quadrant. 1. To find the ſun's meridian altitude for any given day, or the day of the month for any given meridian altitude. Lay the thread to the day of the month in the ſcale next the limb; and the degree it cuts in the limb, is the ſun's meridian altitude. Thus the thread, being laid on the 15th of May cuts 59° 30′, the altitude ſought; and contrarily the thread, being ſet to the meridian altitude, ſhews the day of the month. 2. To find the hour of the day. Having put the bead, which ſlides on the thread, to the ſun's place in the ecliptic, obſerve the ſun's altitude by the quadrant; then, if the thread be laid over the ſame in the limb, the bead will fall upon the hour required. Thus ſuppoſe on the 10th of April, the ſun being then in the beginning of Taurus, I obſerve the ſun's altitude by the quadrant to be 36°; I place the bead to the beginning of Taurus in the ecliptic, and lay the thread over 36° of the limb; and find the bead to fall on the hour-line marked 3 and 9: accordingly the hour is either 9 in the morning, or 3 in the afternoon. Again, laying the bead on the hour given, having firſt rectified, or put it to the ſun's place, the degree cut by the thread on the limb gives the altitude. Note, the bead may be rectified otherwiſe, by bringing the thread to the day of the month, and the bead to the hour-line of 12. 3. To find the ſun's declination from his place given, and contrariwiſe. Set the bead to the ſun's place in the ecliptic, move the thread to the line of declination E T, and the bead will cut the degree of declination required. Contrarily, the bead being adjuſted to a given declination, and the thread moved to the ecliptic, the bead will cut the ſun's place. 4. The ſun's place being given, to find his right aſcenſion, or contrarily. Lay the thread on the ſun's place in the ecliptic, and the degree it cuts on the limb is the right aſcenſion ſought. Contrarily, laying the thread on the right aſcenſion, it cuts the ſun's place in the ecliptic. 5. The ſun's altitude being given, to find his azimuth, and contrariwiſe. Rectify the bead for the time, as in the ſecond article, and obſerve the ſun's altitude; bring the thread to the complement of that altitude; thus the bead will give the azimuth ſought, among the azimuth lines. 6. To find the hour of the night from ſome of the five ſtars laid down on the quadrant. 1. Put the bead to the ſtar you would obſerve, and find how many hours it is off the meridian, by article 2. Then, from the right aſcenſion of the ſtar, ſubſtract the ſun's right aſcenſion converted into hours, and mark the difference; which difference, added to the obſerved hour of the ſtar from the meridian, ſhews how many hours the ſun is gone from the meridian, which is the hour of the night. Suppoſe on the 15th of May the ſun is in the 4th degree of gemini, I ſet the bead to arcturus; and, obſerving his altitude, find him to be in the weſt about 52° high, and the bead to fall on the hour-line of 2 in the afternoon; then will the hour be 11 hours 50 min. paſt noon, or 10 min. ſhort of midnight: for 62°, the ſun's right aſcenſion, converted into time, make 4 hours 8 min. which ſubtracted from 13 hours 58 min. the right aſcenſion of arcturus, the remainder will be 9 hours 50 min. which added to 2 hours, the obſerved diſtance of arcturus from the meridian, ſhews the hour of the night to be 11 hours 50 minutes.

7. Hadley's quadrant, (plate CCXXII. fig. 5.) ſo called from its inventor J. Hadley, eſq; conſiſts of the following particulars: 1. An octant, or $\frac{1}{8}$ part of a circle, A B C. 2. An index D. 3. The ſpeculum E. 4. Two horizontal glaſſes, F, G. 5. Two ſcreens, K, K. 6. Two ſight-vanes, H, I.

The octant conſiſts of two radii, A B, A C, which are ſtrengthened by the braces L, M, and the arch B C; which though containing only 45°, is nevertheleſs divided into 90 primary diviſions, each

each of which ſtands for degrees, and are numbered 0, 10, 20, 30, &c. to 90; beginning at each end of the arch for the convenience of numbering both ways, either for altitudes or zenith-diſtances: again, each degree is ſubdivided into minutes.

The index D, is a flat bar, moveable round the center of the inſtrument; and that part of it which ſlides over the graduated arch, B C, is open in the middle, with Vernier's ſcale on the lower part of it; and underneath is a ſcrew, ſerving to faſten the index againſt any diviſion.

The ſpeculum E, is a piece of flat glaſs, quickſilvered on one ſide, ſet in a braſs-box, and placed perpendicular to the plane of the inſtrument, the middle part of the former coinciding with the center of the latter. And, becauſe the ſpeculum is fixed to the index, the poſition of it will be altered by the moving of the index along the arch. The rays of an obſerved object are received on the ſpeculum, and from thence reflected on one of the horizon-glaſſes, F, G; which are two ſmall pieces of looking-glaſs placed on one of the limbs, their faces being turned obliquely to the ſpeculum, from whence they receive the reflected rays of obſerved objects. This glaſs, F, has only its lower part quickſilvered, and ſet in braſs-work; the upper part being left tranſparent to view the horizon. The glaſs G has in its middle a tranſparent ſlit, through which the horizon is to be ſeen. And becauſe the warping of the wood-work, and other accidents, may diſtend them from their true ſituation, there are three ſcrews paſſing through their feet, whereby they may be eaſily replaced.

The ſcreens are two pieces of coloured glaſs, ſet in two ſquare braſs-frames K, K, which ſerve as ſcreens to take off the glare of the ſun's rays which would be otherwiſe too ſtrong for the eye; the one is tinged much deeper than the other, and, as both of them move on the ſame center, they may be both or either of them uſed: in the ſituation they appear in the figure, they ſerve for the horizon-glaſs F; but, when they are wanted for the horizon-glaſs G, they muſt be taken from their preſent ſituation, and placed on the qnadrant above G.

The ſight-vanes are two pins, H and I, ſtanding at right angles to the plane of the inſtrument; that at H has one hole in it, oppoſite to the tranſparent ſlit in the horizon-glaſs G; the other, at I, has two holes in it, the one oppoſite to the middle of the tranſparent part of the horizon-glaſs F, the other rather lower than the quickſilvered part: this vane has a piece of braſs on the back of it, which moves round a center, and ſerves to cover either of the holes.

There are two ſorts of obſervations to be made with this inſtrument; the one, when the back of the obſerver is turned towards the object, and therefore called the back-obſervation; the other, when the face of the obſerver is turned towards the object, which is called the fore-obſervation.

To rectify the inſtrument for the fore-obſervation: ſlacken the ſcrew in the middle of the handle behind the glaſs F; bring the index cloſe to the button *b*; hold the inſtrument in a vertical poſition, with the arch downwards; look through the right hand hole in the vane I, and through the tranſparent part of the glaſs F, for the horizon; and if it lies in the ſame right line with the image of the horizon, ſeen on the quickſilvered part, the glaſs F is rightly adjuſted; but, if the two horizon-lines diſagree, turn the ſcrew at the end of the handle backwards or forwards, until thoſe lines coincide, then faſten the middle ſcrew of the handle, and the glaſs is rightly adjuſted.

To take the ſun's altitude by the fore-obſervation: having fixed the ſcreens above the horizon-glaſs F, and ſuited them proportionally to the ſtrength of the ſun's rays, turn your face towards the ſun, holding the inſtrument with your right hand, by the braces L, M, in a vertical poſition, with the arch downwards; put your eye cloſe to the right hand hole in the vane I, and view the horizon through the tranſparent part of the horizon-glaſs F, moving at the ſame time the index D, with your left hand, till the reflex ſolar ſpot coincides with the line of the horizon; then the degrees counted from C, or that end next your body, will give the altitude of the ſun at that time, obſerving to add or ſubtract 16 min. according as the upper or lower edge of the ſun's reflex image is made uſe of. But to obtain the ſun's meridian altitude, which is the thing wanted, in order to find the latitude; the obſervations muſt be continued, and, as the ſun approaches the meridian, the index D muſt be continually moved towards B, in order to maintain the coincidence between the reflex ſolar ſpot and the hori-

zon; and confequently, as long as this motion can maintain the fame coincidence, the obfervation muft be continued and when the fun has attained the meridian, and begins to defcend, the coincidence will require a retrograde motion of the index, or towards C; and then is the obfervation finifhed, and the degrees counted, as before, will give the fun's meridian altitude, or thofe from B, the zenith-diftance; obferving to add 16′= femidiam. ☉, if the fun's lower edge is brought to the horizon; or to fubftract 16′, when the horizon and upper edge coincide.

To take the altitude of a ftar by the fore-obfervation: through the vane H, and the tranfparent flit in the glafs G, look directly to the ftar; and at the fame time move the index, till the image of the horizon behind you, being reflected by the great fpeculum, is feen in the quick-filvered part of G, and meets the ftar; then will the index fhew the degrees of the ftar's altitude.

To rectify the inftrument for the back obfervation: flacken the fcrew in the middle of the handle, behind the glafs G; turn the button *b* on one fide, and bring the index as many degrees before *o*, as is twice the drip of the horizon at your height above the water; hold the inftrument vertical with the arch downwards, look through the hole of the vane H, and if the horizon, feen through the tranfparent flit in the glafs G, coincides with the image of the horizon, feen in the quick-filvered part of the fame glafs; then the glafs G is in its proper pofition. But if not, fet it by the handle, and faften the fcrew as before.

To take the fun's altitude by the back obfervation: put the ftem of the fcreens K, K, into the hole *r*, and, in proportion to the ftrength or faintnefs of the fun's rays, let one, both, or neither of the frames of thofe glaffes be turned clofe to the face of the limb; hold the inftrument in a vertical pofition, with the arch downwards, by the braces L, M, with your left hand; turn your back towards the fun, and put your eye clofe to the hole, in the vane H, obferving the horizon through the tranfparent flit in the horizon-glafs G; with your right hand move the index D, till the reflected image of the fun be feen in the quick-filvered part of the glafs G, and in a right line with the horizon; fwing your body to and fro, and if the obfervation be well made, the fun's image will be obferved to brufh the horizon, and the degrees reckoned from C, or that part of the arch fartheft from your body, will give the fun's altitude, at the time of obfervation; obferving to add 16 min. = the fun's femidiameter, if the fun's upper edge be ufed; and fubtract 16 min. from the altitude, if the obfervation refpected the lower edge.

The directions here given, efpecially if joined with thofe delivered under the article LATITUDE, for taking of altitudes at fea, would be fufficient, were there not two corrections neceffary to be made, before the altitude can be accurately affigned, *viz.* one on account of the obferver's eye being raifed above the level of the fea, and the other on account of the refraction occafioned in fmall altitudes by the hazinefs of the atmofphere.

We fhall therefore give a table, fhewing the corrections neceffary to be made to altitudes on both thefe accounts, whether it be taken by Davis's or Hadley's quadrant, or any other inftrument.

height of the eye in feet.	corrections in minutes.	altitude in degrees.	corrections in minutes.	altitude in degrees.	corrections in minutes.
5	2′	1	23′	12	4′
10	3′	2	17½′	15	3½′
15	4′	3	14′	20	2½′
20	5′	4	11′	25	2′
25	5½′	5	9′	30	1½′
30	6′	6	8′	35	1⅓′
35	6½′	7	7′	40	1′
40	7′	8	6′	50	0¾′
45	7½′	9	5½′	60	0½′
50	8′	10	5′	70	0¼′

General rules for ufing this table of corrections. 1. In the fore-obfervations: add the fum of the corrections to the obferved zenith-diftance, for the true zenith-diftance; or, take the fum of the corrections from the obferved altitude, and the remainder will be the altitude. 2. In the back-obfervations, add the dips, or corrections for the height of the eye, and fubftract the refractions, for altitudes; and for zenith-diftances, fubftract the dips, and add the refractions.

Example: By a back obfervation, the altitude of the fun's lower edge was found by Hadley's quadrant to be 25° 12′; the eye being 30 feet above the horizon.

rizon. By the table the dip on 30 feet is 6′, and the refraction on 25° is 2′; therefore 25° 12′—16′ (= femidiam ☉) = 24° 56′, and 24° 56′ + 6′ (by rule 2) = 25° 2′, and laftly 25° 2′ — 2′ (by rule 2) = 25° = the true, or corrected altitude.

We have been the more particular in our defcription and ufe of Hadley's quadrant, as it is undoubtedly the beft hitherto invented.

8. Horodictical quadrant, a pretty commodious inftrument, fo called from its ufe in telling the hour of the day.

Its conftruction is this: from the center of the quadrant, C, (plate CCXXII. fig. 6.) whofe limb A B is divided into 90°, defcribe feven concentric circles at intervals at pleafure; and to thefe add the figns of the zodiac, in the order reprefented in the figure. Then, applying a ruler to the center C, and the limb A B, mark upon the feveral parallels the degrees correfponding to the altitude of the fun when therein, for the given hours; connect the points belonging to the fame hour with a curve line, to which add the number of the hour. To the radius C A fit a couple of fights, and to the center of the quadrant C tie a thread with a plummet, and upon the thread a bead to flide.

If now the bead be brought to the parallel wherein the fun is, and the quadrant directed to the fun, till a vifual ray pafs thro' the fights, the bead will fhew the hour. For the plummet, in this fituation, cuts all the parallels in the degrees correfponding to the fun's altitude. Since then the bead is in the parallel which the fun defcribes, and thro' the degrees of altitude to which the fun is elevated every hour, there pafs hour-lines, the bead muft fhew the prefent hour. Some reprefent the hour-lines by arches of circles, or even by ftraight lines, and that without any fenfible error.

9. Sutton's or Collins's Quadrant, (plate CCXXIII. fig. 1.) is a ftereographic projection of one quarter of the fphere, between the tropics, upon the plane of the ecliptic, the eye being in its northpole; it is fitted to the latitude of London. The lines, running from the right hand to the left, are parallels of altitude; and thofe croffing them are azimuths. The leffer of the two circles, bounding the projection, is one fourth of the tropic of capricorn; the greater is one fourth of that of cancer. The two ecliptics are drawn from a point on the left edge of the quadrant, with the characters of the figns upon them; and the two horizons are drawn from the fame point. The limb is divided both into degrees and time; and, by having the fun's altitude, the hour of the day may be found here to a minute.

The quadrantal arches next the center contain the calendar of months; and under them, in another arch, is the fun's declination.

On the projection are placed feveral of the moft noted fixed ftars between the tropics; and the next below the projection is the quadrant and line of fhadows.

To find the time of the fun's rifing or fetting, his amplitude, his azimuth, hour of the day, *&c.* by this quadrant: lay the thread over the day and the month, and bring the bead to the proper ecliptic, either of fummer or winter, according to the feafon, which is called rectifying; then, moving the thread, bring the bead to the horizon, in which cafe the thread will cut the limb in the time of the fun's rifing or fetting, before or after fix; and at the fame time the bead will cut the horizon in the degrees of the fun's amplitude.

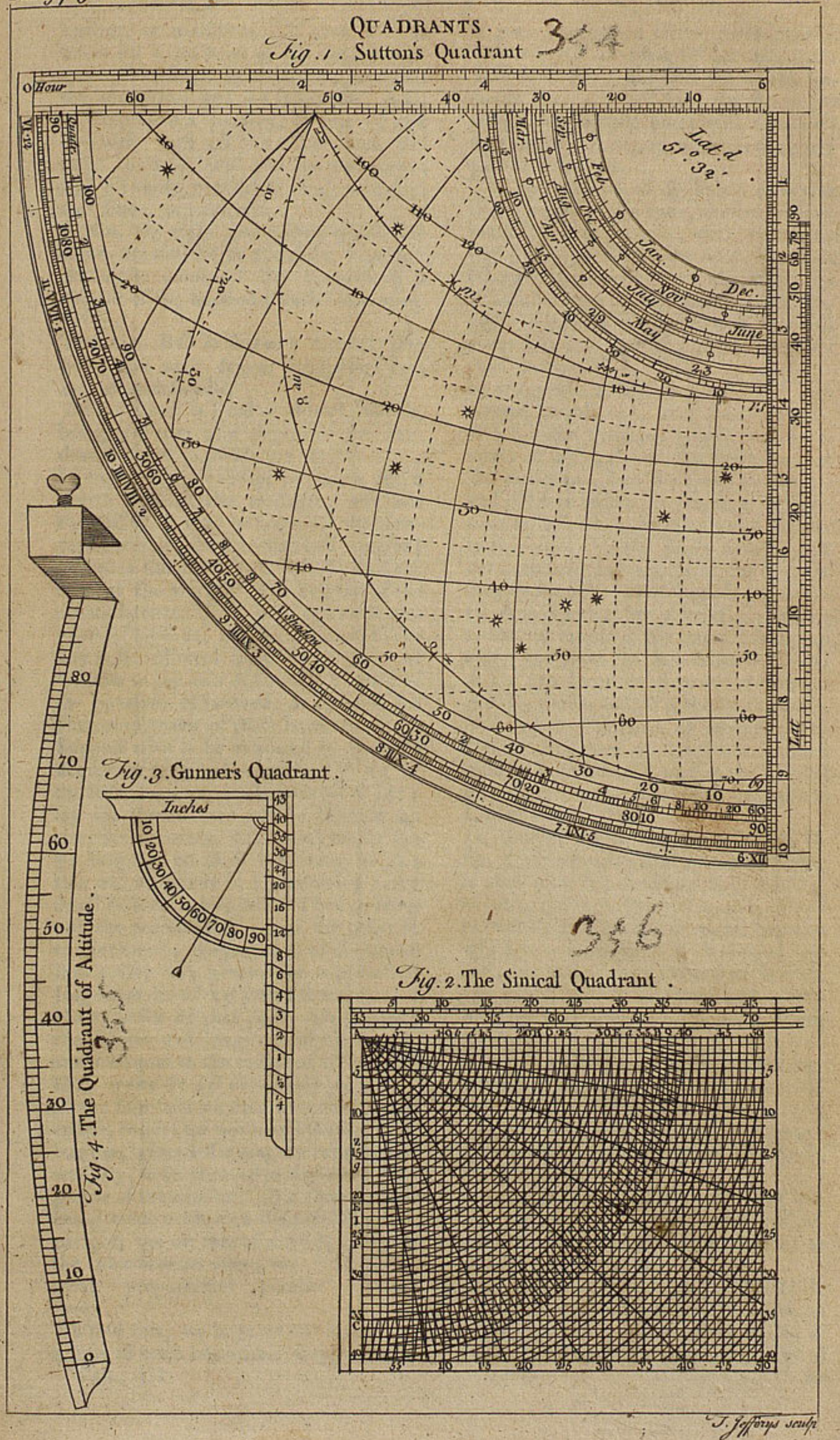
Again, obferving the fun's altitude with the quadrant, and fuppofing it found 45° on the fifth of May, lay the thread over the fifth of May, bring the bead to the fummer ecliptic, and carry it to the parallel of altitude 45°; in which cafe the thread will cut the limb at 55° 15′, and the hour will be feen among the hour-lines to be either 41′ paft nine in the morning, or 19′ paft two in the afternoon.

Laftly, the bead among the azimuths fhews the fun's diftance from the fouth 50° 41′.

But note, that if the fun's altitude be lefs than what it is at fix o'clock, the operation muft be performed among thofe parallels above the upper horizon; the bead being rectified to the winter ecliptic.

10. Sinical quadrant (pl. CCXXIII. fig. 2.) confifts of feveral concentric quadrantal arches, divided into eight equal parts by radii, with parallel right lines croffing each other at right angles.

Now any one of the arches, as B C. may reprefent a quadrant of any great circle of the fphere, but is chiefly ufed for the horizon


QUADRANTS.
Fig. 1. Sutton's Quadrant
Hour
Lat.d 51.° 32'.
Dec.
June
May
July
Nov.
Jan.
Feb.
Mar.
Apr.
Aug.
Sep.
Oct.
Lat.
Fig. 3. Gunner's Quadrant.
Inches
Fig. 2. The Sinical Quadrant.
Fig. 4. The Quadrant of Altitude.
J. Jefferys sculp.

horizon or meridian. If then BC be taken for a quadrant of the horizon, either of the sides, as AB, may represent the meridian; and the other side, AC, will represent a parallel, or line of east and west: and all the other lines, parallel to AB, will also be meridians; and all those parallel to AC, east and west lines, or parallels.

Again, the eight spaces into which the arches are divided by the radii, represent the eight points of the compass in a quarter of the horizon; each containing 11° 15′.

The arch BC is likewise divided into 90°, and each degree subdivided into 12′, diagonal-wise.

To the center is fixed a thread, which, being laid over any degree of the quadrant, serves to divide the horizon.

If the sinical quadrant be taken for a fourth part of the meridian, one side thereof, AB, may be taken for the common radius of the meridian and equator; and then the other, AC will be half the axis of the world. The degrees of the circumference, BC, will represent degrees of latitude, and the parallels to the side AB, assumed from every point of latitude to the axis AC, will be radii of the parallels of latitude, as likewise the sine complement of those latitudes.

Suppose then it be required to find the degrees of longitude contained in 83 of the lesser leagues, in the parallel of 48°; lay the thread over 48° of latitude on the circumference, and count thence the 83 leagues, on AB beginning at A; this will terminate in H, allowing every small interval 4 leagues. Then tracing out the parallel HE, from the point H to the thread; the part AE of the thread shews that 125 greater or equinoctial leagues make 6° 15′; and therefore that the 83 lesser leagues AH, which make the difference of longitude of the course, and are equal to the radius of the parallel HE, make 6° 15′ of the said parallel.

If the ship sails an oblique course, such course, besides the north and south greater leagues, gives lesser leagues easterly and westerly, to be reduced to degrees of longitude of the equator. But these leagues being made neither on the parallel of departure, nor on that of arrival, but in all the intermediate ones; we must find a mean proportional parallel between them.

To find this, we have on the instrument a scale of cross latitudes. Suppose then it were required to find a mean parallel between the parallels of 40° and 60°: with your compasses take the middle between the 40th and 60th degree on the scale: this middle point will terminate against the 51st degree, which is the mean parallel required.

The principal use of the sinical quadrant is to form triangles upon, similar to those made by a ship's way, with the meridians and parallels; the sides of which triangles are measured by the equal intervals between the concentric quadrants, and the lines N and S, E and W: and every fifth line and arch is made deeper than the rest.

Now suppose a ship to have sailed 150 leagues north-east, one fourth north, which is the third point, and makes an angle of 33° 45′ with the north-part of the meridian: here are given the course and distance sailed, by which a triangle may be formed on the instrument, similar to that made by the ship's course; and hence the unknown parts of the triangle may be found. Thus supposing the center A to represent the place of departure; count, by means of the concentric circles along the point the ship sailed on, *viz.* AD, 150 leagues: then in the triangle AED, similar to that of the ship's course, find AE = difference of latitude; and DE = difference of longitude, which must be reduced according to the parallel of latitude come to. See the article Longitude, &c.

II. Gunner's quadrant (plate CCXXIII. fig. 3.) sometimes called gunner's square, is that used for elevating and pointing cannon, mortars, &c. and consists of two branches either of brass or wood, between which is a quadrantal arch divided into 90°, beginning from the shorter branch, and furnished with a thread and plummet, as represented in the plate above referred to.

The use of the gunner's quadrant is extremely easy; for if the longest branch be placed in the mouth of the piece, and it be elevated till the plummet cut the degree necessary to hit a proposed object, the thing is done.

Sometimes on one of the surfaces of the long branch, are noted the division of diameters, and weights of iron bullets, as also the bores of pieces.

Quadrant *of altitude*, (plate CCXXIII. fig. 4.) is an appendage of the artificial globe, consisting of a lamina, or slip of brass, the length of a quadrant of one of the

the great circles of the globe, and graduated. At the end, where the division terminates, is a nut riveted on, and furnished with a screw, by means whereof the instrument is fitted on to the meridian, and moveable round upon the rivet, to all points of the horizon, as represented in the figure referred to.

Its use is to serve as a scale in measuring of altitudes, amplitudes, azimuths, &c. See the article GLOBE.

QUADRANTAL, in roman antiquity, a vessel every way square like a die, serving as a measure of liquids: its capacity was eighty libræ or pounds of water, which made forty-eight sextaries, two urnæ, or eight congii.

QUADRANTAL TRIANGLE, a spherical triangle, one of whose sides at least is a quadrant of a circle, and one of its angles a right angle. See TRIANGLE.

QUADRAT, *quadratum*, a mathematical instrument, called also a geometrical square, and line of shadows: it is frequently an additional member on the face of the common quadrant, as also on those of Gunter's and Sutton's quadrant; but we shall describe it by itself, as being a distinct instrument.

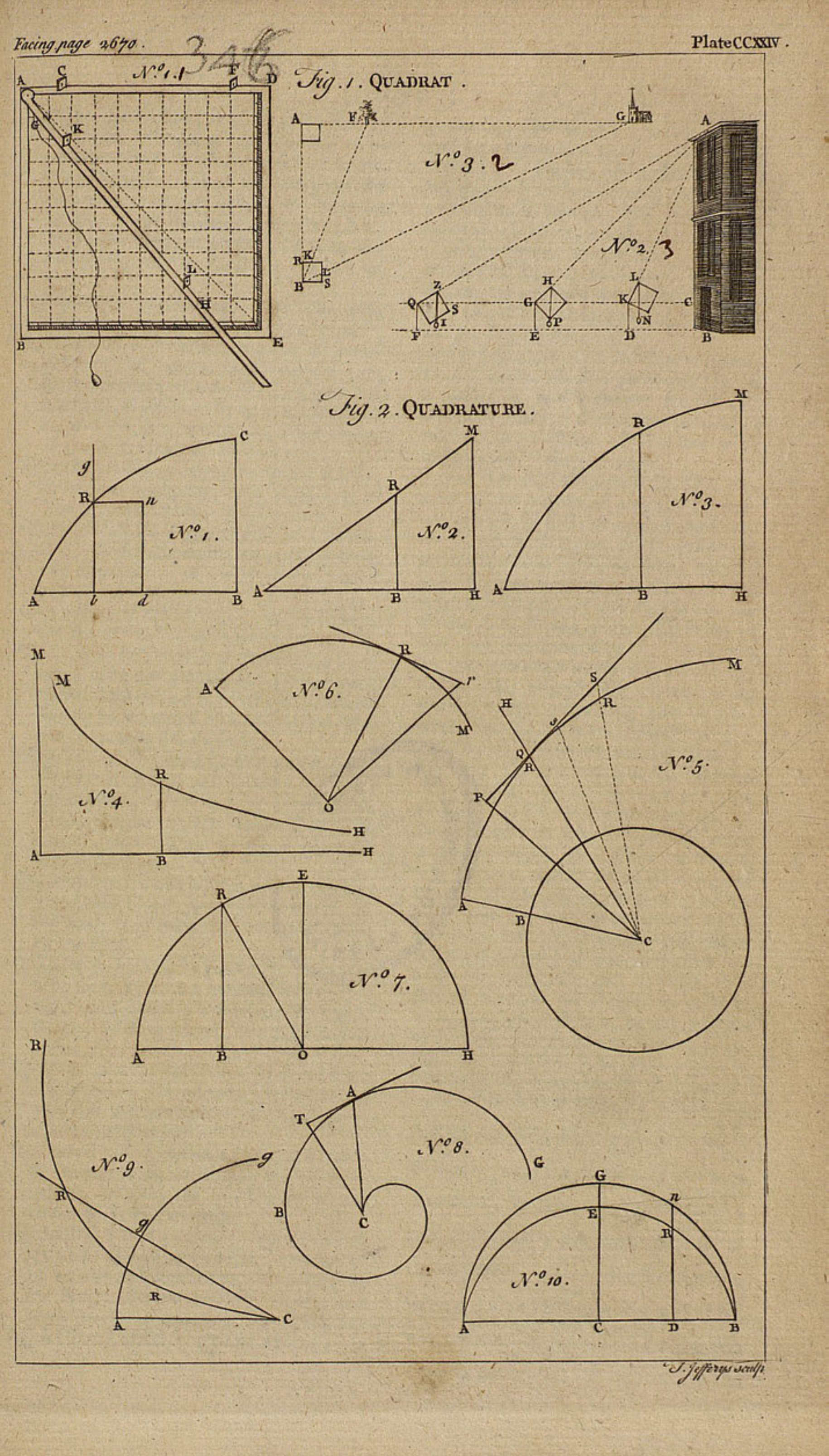
It is made of any solid matter, as brass, wood, &c. or of any four plain rules joined together at right angles, as represented in plate CCXXIV. fig. 1. n° 1. where A is the center, from which hangs a thread with a small weight at the end, serving as a plummet. Each of the sides, BE, and DE, is divided into an hundred equal parts; or, if the sides be long enough to admit of it, into a thousand parts; C and F are two sights, fixed on the side A D. There is, moreover, an index GH, which, when there is occasion, is joined to the center A, in such a manner as that it can move freely round, and remain in any given situation: on this instrument are two sights, K, L, perpendicular to the right line going from the center of the instrument. The side DE is called the upright side, or the line of the direct or upright shadows; and the side BE is termed the reclining side, or the line of the versed or backshadows.

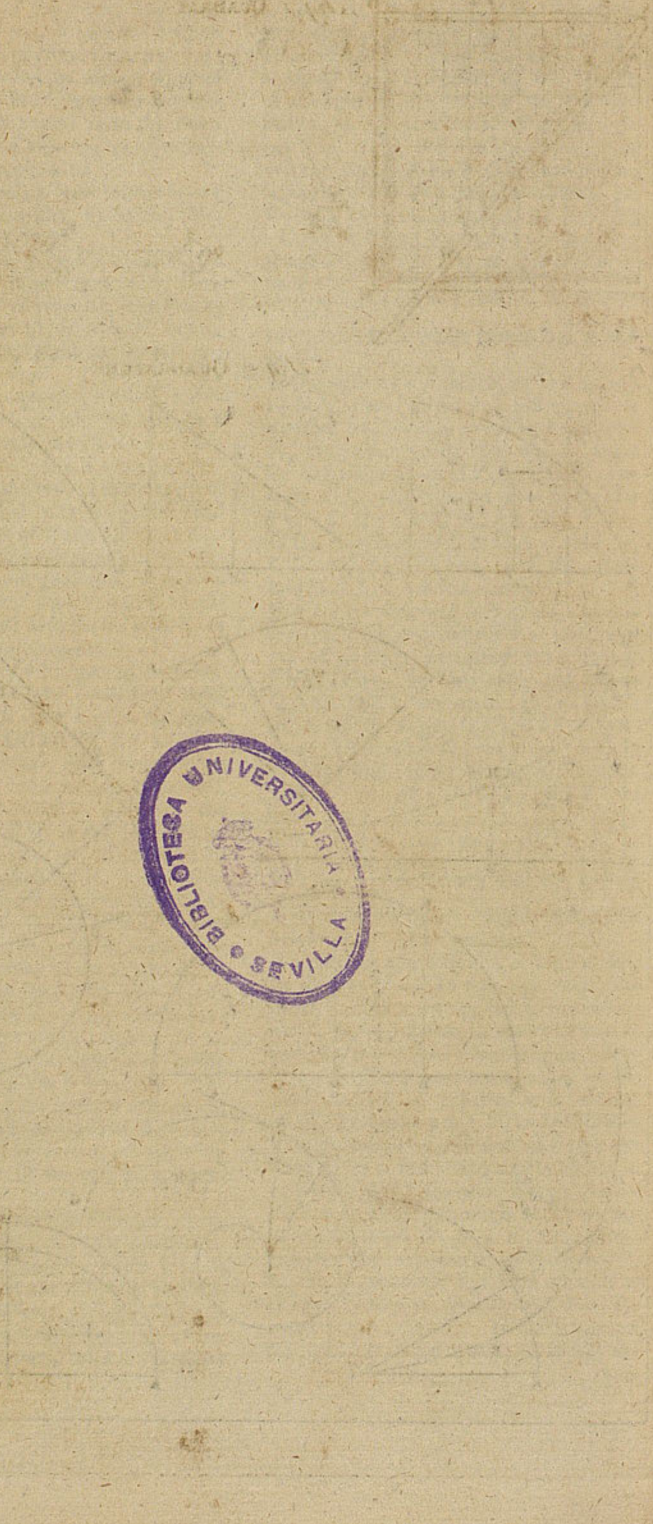
To measure an accessible height, AB, (*ibid.* n° 2.) by the quadrat, let the distance BD be measured, which suppose $=96$ feet, and let the height of the observer's eye be 6 feet; then holding the instrument with a steady hand, or rather resting it on a support, let it be directed towards the summit A, so that it may be seen clearly through both sights; the perpendicular or plum-line mean while hanging free, and touching the surface of the instrument: let now the perpendicular be supposed to cut off on the upper side, KN, 80 equal parts; it is evident, that LKN, ACK, are similar triangles, and (by prop. 4. lib. 6. of Euclid) NK : KL : : KC (*i. e.* BD) : CA; that is, 80 : 100 : : 96 : CA; therefore, by the rule of three, $CA = \frac{96 \times 100}{80} = 120$ feet; and $CB = 6$ feet being added, the whole height BA is 126 feet.

If the observer's distance, as DE (*ibid.*) be such, that, when the instrument is directed as formerly towards the summit A, the perpendicular fall on the angle P, and the distance BE or CG be 120 feet, CA will also be 120 feet: for PG : GH : : GC : CA; but $PG = GH$, therefore $GC = CA$; that is, CA will be 120 feet, and the whole height $BA = 126$ feet, as before.

But let the distance BF (*ibid.*) be 300 feet, and the perpendicular or plum-line cut off 40 equal parts from the reclining side. Now, in this case, the angles QAC, QZI, are equal (29. 1. Eucl.) as are also the angles QZI, ZIS: therefore ∠ZIS = QAC; but ZSI = QCA, as being both right: hence, in the æquiangular triangles ACQ, SZI, we have (by 4. 6. Eucl.) ZS : SI : : CQ : CA; that is, 100 : 40 : : 300 : CA, or $CA = \frac{40 \times 300}{100} = 120$; and by adding 6 feet, the observer's height, the whole height BA will be 126 feet.

To measure any distance, at land or sea, by the quadrat. In this operation, the index AH is to be applied to the instrument, as was shown in the description; and, by the help of a support, the instrument is to be placed horizontally at the point A (*ibid.* n° 3.) then let it be turned till the remote point, F, whose distance is to be measured, be seen through the fixed sights: and bringing the index to be parallel with the other side of the instrument, observe through its sights any accessible mark B, at a distance; then carrying the instrument to the point B, let the immoveable sights be directed to the first station A, and the sights of the index to the point F. If the index cut the right side of the square, as in K, the pro-


Fig. 1. QUADRAT.
N.o 1. 1
N.o 3. 2
N.o 2. 3
Fig. 2. QUADRATURE.
N.o 1.
N.o 2.
N.o 3.
N.o 4.
N.o 5.
N.o 6.
N.o 7.
N.o 8.
N.o 9.
N.o 10.
T. Jefferys sculp.


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proportion will be (by 4. 6.) BR : RK :: BA (the diſtance of the ſtations to be meaſured with a chain) : AF, the diſtance ſought. But if the index cut the reclined ſide of the ſquare, in the point L; then the proportion is LS : SB :: BA : AG, the diſtance ſought; which, accordingly, may be found by the rule of three.

QUADRAT, in aſtrology, the ſame with quartile. See the article QUARTILE.

QUADRAT, in printing, a piece of metal caſt like the letters, to fill up the void ſpaces between words, &c. There are quadrats of different ſizes, as m quadrats, n quadrats, &c. which are, reſpectively, of the dimenſions of theſe letters.

QUADRATA LEGIO, a ſquare legion, in roman antiquity, one conſiſting of four thouſand men. See LEGION.

QUADRATIC EQUATION, in algebra, that wherein the unknown equality is of two dimenſions, or raiſed to the ſecond power. See EQUATION and POWER.

Conſtruction of QUADRATIC EQUATIONS. See the article CONSTRUCTION.

QUADRATING *of a piece*, among gunners, is the due placing of a piece of ordnance, and poiſing it in its carriage, and having its wheels of an equal height, &c. See the article GUNNERY.

QUADRATO-CUBUS, QUADRATO-QUADRATO-CUBUS, and QUADRATO-CUBO-CUBUS, according to Diophantus, Vieta, Oughtred, &c. denotes the fifth, ſeventh, and eighth powers. See the article POWER.

QUADRATO-QUADRATUM, or BIQUADRATUM, the fourth power of numbers, or the product of the cube when multiplied by the root.

QUADRATRIX, in geometry, a mechanical line, by means whereof we can find right lines equal to the circumference of circles, or other curves, and their ſeveral parts.

QUADRATRIX *of Dinoſtrates*, ſo called from its inventor Dinoſtrates, is a curve, whereby the quadrature of the circle is effected mechanically.

QUADRATRIX *Tſchirnhauſiana*, is a tranſcendental curve invented by M. Tſchirnhauſen, whereby the quadrature of the circle is likewiſe effected.

QUADRATUM-CUBI, QUADRATO-QUADRATO-QUADRATUM, and QUADRATUM-SURDESOLIDI, according to the Arabs, denote the ſixth, eighth, and tenth powers of numbers. See POWER.

QUADRATURE, QUADRATURA, in geometry, denotes the ſquaring, or reducing a figure to a ſquare. Thus, the finding of a ſquare, which ſhall contain juſt as much ſurface or area, as a circle, an ellipſis, a triangle, &c. is the quadrature of a circle, ellipſis, &c.

The quadrature of rectilinear figures, or method of finding their areas, has been delivered under their ſeveral articles TRIANGLE, PARALLELOGRAM, TRAPEZIUM, POLYGON, &c.

But the quadrature of curvilinear ſpaces, as the circle, ellipſis, parabola, &c. is a matter of much deeper ſpeculation, making a part of the higher geometry; wherein the doctrine of fluxions is of ſingular uſe. See FLUXION.

Caſe I. Let ARC (plate CCXXIV. fig. 2. n° 1.) be a curve of any kind, whoſe ordinates Rb, CB, are perpendicular to the axis AB. Imagine a right line bRg, perpendicular to AB, to move parallel to itſelf from A towards B; and let the velocity thereof, or the fluxion of the abſciſs Ab, in any propoſed poſition of that line, be denoted by bd, then will bn, the rectangle under bd and the ordinate bR, expreſs the correſponding fluxion of the generating area AbR; which fluxion, if A$b = x$, and bR $= y$, will be $y\dot{x}$. From whence, by ſubſtituting for y or x, according to the equation of the curve, and taking the fluent, the area itſelf AbR will become known.

But in order to render this ſtill more plain, we ſhall give ſome examples, wherein x, y, z, and u are all along put to denote the abſciſs, ordinate, curve-line, and the area reſpectively, unleſs where the contrary is expreſsly ſpecified.

Thus, if the area of a right angled triangle be required; put the baſe AH (*ib.* n° 2.) $= a$, the perpendicular HM $= b$, and let AB $= x$, be any portion of the baſe, conſidered as a flowing quantity; and let BR $= y$, be the ordinate, or perpendicular correſponding. Then becauſe of the ſimilar triangles AHM and ABR, we ſhall have $a : b :: x : y = \frac{bx}{a}$. Whence, $y\dot{x}$, the fluxion of the area ABR, is, in this caſe, equal to $\frac{bx\dot{x}}{a}$; and conſequently the fluent thereof, or the area itſelf, $= \frac{bx^2}{2a}$: which, therefore, when $x = a$, and BR coincides with HM, will become $\frac{ab}{2} = \frac{AH \times HM}{2} =$ the area of

of the whole triangle A H M; as is also demonstrable from the principles of common geometry. See TRIANGLE.

Again, let the curve A R M H (*ibid.* n° 3.) whose area you would find, be the common parabola; in which case, if $AB = x$, and $BR = y$, and the parameter $= a$; we shall have $y^2 = ax$, and $y = a^{\frac{1}{2}} x^{\frac{1}{2}}$: and therefore $\dot{u}\ (= y\dot{x}) = a^{\frac{1}{2}} x^{\frac{1}{2}} \dot{x}$; whence $u = \frac{2}{3} \times a^{\frac{1}{2}} x^{\frac{3}{2}} = \frac{2}{3} a^{\frac{1}{2}} x^{\frac{1}{2}} \times x = \frac{2}{3} y x = \frac{2}{3} \times AB \times BR$. Hence a parabola is two-thirds of a rectangle of the same base and altitude.

The same conclusion might have been found more easily in terms of y: for $x = \frac{y^2}{a}$, and $\dot{x} = \frac{2y\dot{y}}{a}$; and consequently $\dot{u}\ (= y\dot{x}) = \frac{2y^2\dot{y}}{a}$; whence $u = \frac{2y^3}{3a} = \frac{2y}{3} \times \frac{y^2}{a} = \frac{2y}{3} \times x = \frac{2}{3} \times AB \times BR$, as before.

To determine the area of the hyperbolic curve A M R B (*ibid.* n° 4.) whose equation is $x^m y^n = a^{m+n}$; whence we have $y = \frac{a^{\frac{m+n}{n}}}{x^{\frac{m}{n}}} = a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}}$; and therefore $\dot{u}\ (= y\dot{x}) = a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}} \dot{x}$, whose fluent is $u = \frac{a^{\frac{m+n}{n}} \times x^{1-\frac{m}{n}}}{1-\frac{m}{n}} = \frac{na^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{n-m}$; which, when $x = 0$, will also be $= 0$, if n be greater than m; therefore the fluent requires no correction in this case; the area A M R B, included between the asymptote A M, and the ordinate B R, being truly defined by $\frac{na^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{n-m}$, as above. But if n be less than m, then the fluent, when $x = 0$, will be infinite, because the index $\frac{n-m}{n}$ being negative, o becomes a divisor to $na^{\frac{m+n}{n}}$; whence the area AMRB will also be infinite.

But here, the area B R H, comprehended between the ordinate, the curve, and the part B H, of the asymptote, is finite, and will be truly expressed by $\frac{na^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{m-n}$, the same quantity with its signs changed: for the fluxion of the part A M R B being $a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}} \dot{x}$, that of its supplement B R H must con- sequently be $-a^{\frac{m+n}{n}} \times x^{\frac{-m}{n}} \dot{x}$, where- of the fluent is $-\frac{a^{\frac{m+n}{n}} \times x^{\frac{1-m}{n}}}{1-\frac{m}{n}} = \frac{a^{\frac{m+n}{n}} \times x^{\frac{n-m}{n}}}{m-n} =$ the area BRH, which wants no correction; because when x is infinite, and the area $BRH = 0$, the said fluent will also entirely vanish; since the value of $x^{\frac{m-n}{n}}$, which is a divisor to $a^{\frac{m+n}{n}}$, is then infinite.

Case II. Let A R M (*ibid.* n° 5.) be any curve, whose ordinates C R, C R, are all referred to a point or center; conceive a right line C R H, to revolve about the given center C, and let a point R, move along the said line, so as to trace out or describe the proposed curve A R M. Now it is evident, that, if the point R was to move from any position Q, without changing its direction and velocity, it would proceed along the tangent Q S, instead of the curve, and describe areas Q s C, Q S C, about the center C, proportional to the times of their description; because those areas or triangles, having the same altitude, C P, are as the bases Q s and Q S; and these are as the times because the motion in the tangent, upon that supposition, would be uniform.

Hence, if R S be taken to denote the value of $\dot{z}$, the fluxion of the curve line A R, the corresponding fluxion of the area A R C, will be truly represented by the uniformly generated triangle Q C S. And putting the perpendicular CP, drawn from the center to the tangent, equal to s, we shall have $\frac{s\dot{z}}{2} \left(= \frac{QS \times CP}{2}\right)$; for the fluxion of the area, from whence the area itself may be found.

But

But since, in many cases, the value of $\dot{z}$ cannot be computed (from the property of the curve) without considerable trouble, the two following expressions, for the fluxion of the area, will commonly be found more commodious, *viz.* $\frac{s y \dot{y}}{2t}$ and $\frac{y^2 \dot{x}}{2a}$; where t = RP, and x = the arch BN of a circle, described about the center C, at any distance a (=CB). These expressions are derived from that above, in the following manner, *viz.* $\dot{z} : \dot{y} :: y$ (CR) : t (RP); therefore $\dot{z} = \frac{y\dot{y}}{t}$; and consequently $\frac{s\dot{z}}{2} = \frac{s y \dot{y}}{2t}$, which is the first expression. Again, because the velocity of R, in the direction of the tangent, is denoted by $\dot{z}$, that in a direction perpendicular to CQ (whereby the point R revolves about the center C) will be ($= \frac{CP}{CR} \times \dot{z}$) $= \frac{s\dot{z}}{y}$; which being to $\dot{x}$, the velocity of the point N, about the same center, as the distance or radius CR (y) to the radius CN (a) we have $\frac{as\dot{z}}{y} = y\dot{x}$; and consequently, $\frac{s\dot{z}}{2} = \frac{y^2 \dot{x}}{a2}$, which is the other expression.

In order to illustrate this case, let it be required to determine the area of the circular sector AOR (*ibid.* n° 6.) for putting the radius AO (or OR) $= a$, the arch AR (considered as variable by the motion of R) $= z$, and R$r = \dot{z}$: the fluxion of the area will here be expressed by $\frac{a\dot{z}}{2}$ (= the triangle ORr): whence the area itself is $= \frac{az}{2} =$ AO$\times\frac{1}{2}$AR; so that it appears, that the area of any circle is expressed by a rectangle under half the circumference, and half the diameter. See the article RECTIFICATION.

Again, suppose it were required to find the area of a semi-circle AREH (*ibid.* n° 7.) Put the diameter AH $= a$, AB $= x$, and BR $= y$, &c. as usual, and we have $y^2 = ax - xx$; and consequently $\dot{u}$ ($= y\dot{x}$) $= \dot{x}\sqrt{ax - xx} = a^{\frac{1}{2}} x^{\frac{1}{2}} \dot{x} \times \overline{1 - \frac{x}{a}}\Big|^{\frac{1}{2}}$. But as this expression does not admit of a fluent in finite terms, it must be resolved into an infinite series, *viz.* $\dot{u} = a^{\frac{1}{2}} x^{\frac{1}{2}} \dot{x} \times \overline{1 - \frac{x}{2a} - \frac{x^2}{8a^2} - \frac{x^3}{16a^3} - \frac{5x^4}{128a^4}}$, &c. $= a^{\frac{1}{2}} \times x^{\frac{1}{2}}\dot{x} - \frac{x^{\frac{3}{2}}\dot{x}}{2a} - \frac{x^{\frac{5}{2}}\dot{x}}{8a^2} - \frac{x^{\frac{7}{2}}\dot{x}}{16a^3}$, &c. From whence the fluent of every term being taken, according to the common method, there will come out $u = a^{\frac{1}{2}} \times \overline{\frac{2x^{\frac{3}{2}}}{3} - \frac{x^{\frac{5}{2}}}{5a} - \frac{x^{\frac{7}{2}}}{28a^2} - \frac{x^{\frac{9}{2}}}{72a^3} - \frac{5x^{\frac{11}{2}}}{704a^4}}$, &c. $= x\sqrt{ax} \times \overline{\frac{2}{3} - \frac{x}{5a} - \frac{x^2}{28a^2} - \frac{x^3}{72a^3} - \frac{5x^4}{704a^4}}$, &c. = the area ABR. Now when $x = \frac{1}{2}a$, the ordinate BR, will coincide with the radius OE; in which case, the area becomes $= \frac{1}{2}a\sqrt{\frac{1}{2}aa} \times \overline{\frac{2}{3} - \frac{1}{10} - \frac{1}{112} - \frac{1}{576} - \frac{5}{11264}}$, &c. $= \frac{a^2\sqrt{\frac{1}{2}}}{2} \times \overline{0.6666 - 0.1 - 0.0089 - 0.0017 - 0004}$, &c. $= 0.1964\,a^2$; which multiplied by 2, gives $0.3928\,a^2$, for the area of the semi-circle AEH, nearly.

As the foregoing series converges but slowly, it may be of use to try, whether, by computing the area of a lesser portion ABR, that of the whole may not be obtained more quickly; and where x being small in comparison of a, the series may have such a rate of convergency, that a small number of terms will be sufficient. Now, in order to this, it is well known that, if the arch AR, be taken $= \frac{1}{3}$ AE, or 30°, the sine BR will be $\frac{1}{2}$ AO; and consequently AB ($= x$) = AO − OB = AO $- \sqrt{OR^2 - BR^2}$; which, if the radius AO $= 1$, will be 0.1339746, very nearly. This, therefore, will be the value of a, being substituted in the fore-mentioned series, *viz.* $\sqrt{ax^3} \times \overline{\frac{2}{3} - \frac{x}{5a} - \frac{x^2}{28a^2}}$, &c. we have $0.0693505 \times \overline{0.6666666 - 0.0133975 - 0.0001603 - 0.0000042}$, &c. $= 0.0693505 \times 0.6531046 = 0.0452931$ = the area ABR; which, added to the area OBR ($=$ OB $\times \frac{1}{2}$ BR $= \sqrt{\frac{3}{4}} \times \frac{1}{4} = 0.2165063$) gives 0.2617994, for the area of the sector AOR, the treble whereof 0.7853982 (because AR $= \frac{1}{3}$ AE) will therefore be the area of the whole quadrant AOE: and this number, found by taking only four terms of the series, is true to the last decimal place.

If it were required to find the area of the loga-

logarithmic fpiral CBAC (*ibid.* n° 8.) let the right line AT, touch the curve in A; upon which, from the center C, let fall the perpendicular CT. Then, fince by the nature of the curve, the angle TAC is every where the fame; the ratio of AT (t) to CT (s) will here be conftant; and therefore the fluent of $\frac{s}{t} \times \frac{y\dot{y}}{2} = \frac{s}{t} \times \frac{y^2}{4} =$ the area of CBAC.

Again, to find the area CRRC (*ibid.* n° 9.) of the fpiral of Archimedes, CRRR; let AC be a tangent to the curve at the center C, about which center, with the radius AC ($=a$) fuppofe a circle Agg, to be defcribed; then the arch (or abfcifs) Ag, correfponding to any propofed ordinate CR, being to that ordinate in a given or conftant ratio (fuppofe as m to n) we have $x\ (=Ag) = \frac{my}{n}$; therefore $\dot{u} = \frac{y^2\dot{x}}{2a} = \frac{my^2\dot{y}}{2an}$; and confequently $u = \frac{my^3}{6an} =$ the area CRRC.

Laftly, let the curve propofed be the ellipfis AEB (*ibid.* n° 10.) whofe area is required; in order to find which, put the tranfverfe axis $AB = a$, and the conjugate axis $(2\,CE) = c$, and we fhall have (by the property of the curve) $y\ (=DR) = \frac{c}{a}\sqrt{ax - xx}$; and confequently $\dot{u}\ (= y\dot{x}) = \frac{c}{a} \times \dot{x}\sqrt{ax - xx} =$ the fluxion of the area ARD. But $\dot{x}\sqrt{ax - xx}$ is known to exprefs the fluxion of the correfponding fegment ADn, of the circumfcribing femi circle, whofe fluent is therefore given, or may be found by the method of quadrating the circle above delivered. Let this fluent be denoted by A, and that of $\frac{c}{a} \times \dot{x}\sqrt{ax - xx}$ will confequently be $= \frac{c}{a} \times$ A. Hence, the area of the fegment of an ellipfis is to the area of the correfponding fegment of its circumfcribing circle, as the leffer axis of the ellipfis is to the greater; whence it follows, that the whole ellipfis muft be to the whole circle in the fame ratio.

QUADRATURE, in aftronomy, that afpect of the moon when fhe is 90° diftant from the fun; or when fhe is in a middle point of her orbit, between the points of conjunction and oppofition, namely, in the firft and third quarters. See MOON.

QUADRATURE-LINES, are two lines placed on Gunter's fector; they are marked with Q. and 5, 6, 7, 8, 9, 10: of which Q. fignifies the fide of the fquare, and the other figures the fides of polygons of 5, 6, 7, &c. fides. S, on the fame inftrument, ftands for the femi-diameter of a circle, and 90 for a line equal to 90° in circumference.

QUADRATUS, in anatomy, a name given to feveral mufcles on account of their fquare figure; as, 1. The quadratus femoris, or of the thigh, which has its origin from the tubercle of the ifchium, and its termination at an eminence between the two trochanters. 2. The quadratus lumborum, or of the loins, which has its origin in the anterior and fuperior part of the pofterior procefs of the os ilei, and its end at the tranfverfe apophyfes of the vertebræ of the loins, the laft vertebra of the thorax, and the laft rib. 3. The quadratus of the radius, which has its origin in the lower part of the ulna, and its termination oppofite to the lower part of the radius.

QUADREL, in building, a kind of artificial ftone, fo called from its being perfectly fquare.

The quadrels are made of chalky earth, &c. and dried in the fhade for two years. Thefe were formerly in great requeft among the italian architects.

QUADRIGA, in antiquity, a car or chariot drawn by four horfes.

On the reverfes of medals, we frequently fee the emperor or victory in a quadriga, holding the reins of the horfes; whence thefe coins are, among the curious, called nummi quadrigati, and victoriati.

QUADRILATERAL, in geometry, a figure whofe perimeter confifts of four right lines, making four angles; whence it is alfo called a quadrangular figure. The quadrilateral figures are either a parallelogram, trapezium, rectangle, fquare, rhombus, or rhomboides. See TRAPEZIUM, RECTANGLE, &c.

QUADRILL, *quadrilla*, a little troop or company of cavaliers, pompoufly dreffed, and mounted for the performance of caroufals, jufts, tournaments, runnings at the ring, and other gallant divertifements.

A regular caroufal is faid to have at leaft four, and at moft twelve quadrills. Of thefe quadrills each is to confift of at leaft three cavaliers, and at moft of twelve. The quadrills are diftinguifhed by the forms of their habits, or the diverfity of their colours.

QUADRILLE is alfo a game at cards, fometimes called ombre by four; which chiefly differs from ombre by three, in being

being played by four persons, and having all the forty cards dealt out, to each person, at ten each. See OMBRE.

The general laws of this game are, 1. It is not permitted to deal the cards any otherwise than four by three, the dealer being at liberty to begin with which of those numbers he pleases. 2. If he who plays either sans prendre, or calling a king, names a trump of a different suit from that his game is in, or names two several suits, that which he first named must be the trump. 3. He who plays must name the trump by its proper name, as he likewise must the king he calls. 4. He who has said *I pass*, must not be again admitted to play, except he plays by force, upon account of his having spadille. 5. He who has asked the question, and has leave given him to play, is obliged to do it; but he must not play sans prendre except he is forced to do it. 6. He who has the four kings may call the queen of either of his kings. 7. Neither the king nor queen of the suit which is trumps, must be called. 8. He who has one, or several kings, may call any king he has in his hand; in such case, if he wins, he alone must make six tricks: if he wins it is all his own, and if he loses he pays all by himself. 9. Every one ought to play in his turn, but for having done otherwise no one must be beasted. 10. He, however, whose turn it is not to play, having in his hand the king the ombre has called, and shall trump about with either spadille, manille, or basto, or shall even play down the king that was called, to give notice of his being the friend, must not pretend to undertake the vole; nay he must be condemned to be beasted if it appears that he did it with any fraudulent design. 11. He who has drawn a card from his game, and presented it openly in order to play it, is obliged so to do, if his retaining it may be either prejudicial to the game or give any intimation to the friend, especially if the card is a matadore: but he who plays sans prendre, or calls his own king, is not subject to this law. 12. None ought to look upon the tricks, nor to count aloud what has been played, except when it is his turn to play, but to let every one reckon for himself. 13. He who instead of turning up the tricks before any one of his players, shall turn up and discover his game, must be equally beasted with him whose cards he had so discovered, the one paying one half and the other the like. 14. He who renounces must be beasted as many times as he has so done; but if the cards are mixed he is to pay but one beast. 15. If the renounce prejudices the game, and the deal is not played out, every one may take up his cards, beginning at the trick where the renounce was made, and play them over again. 16. He who shews the game before the deal is out must be beasted, except he play sans prendre. 17. None of the three matadores can be commanded down by an inferior trump. 18. If he who plays sans prendre with the matadores in his hand, demands only one of them, he must receive only that he mentioned. 19. He who instead of sans prendre shall demand matadores, not having them; or he who shall demand sans prendre instead of matadores, cannot compel the players to pay him what is really his due. 20. Matadores are only paid when they are in the hands of the ombre, or of the king his ally, whether all in one hand or separately in both. 21. He who undertakes the vole and does not make it, must pay as much as he would have received had he won it. 22. He who plays and does not make three tricks is to be beasted alone, and must pay all that is to be paid; and if he makes no tricks at all, he must also pay to his two adversaries the vole, but not to his friend.

QUADRUPEDS, *quadrupedia*, in zoology, a class of land animals, with hairy bodies, and four limbs or legs proceeding from the trunk of their bodies: add to this, that the females of this class are viviparous, or bring forth their young alive, and nourish them with milk from their teats.

This class, though still numerous enough, will be considerably lessened in number, by throwing out of it the frog, lizard, and other four-footed amphibious animals. See the article AMPHIBIOUS.

On the other hand, it will be increased by the admission of the bat; which, from its having the fore-feet webbed with a membrane, and using them as birds do their wings in flying, has erroneously been ranked among the bird-kind. See the article BIRD.

Linnæus, whose history of zoology we have generally followed, subdivides the quadruped-class into six orders, which he characterizes from the number, figure, and disposition of their teeth; the first order he calls anthropomorpha, from their resemblance

femblance to the human fhape: thefe have four fore-teeth in each jaw, as reprefented in plate CCXXV. fig. 1. n° 1. The feræ, or beafts of prey, make the fecond order, and are diftinguifhed by having fix fharp pointed fore-teeth in each jaw, and very long canine teeth, *ibid.* n° 2. The third order, denominated agriæ, is fufficiently diftinguifhed by having no teeth at all, *ibid.* n° 3. The glires make the fourth clafs, and are diftinguifhed by having the fore-teeth only two in number, and thofe prominent: *ibid.* n° 4. The pecora conftitute the fifth order, and have no fore-teeth at all in the upper-jaw, and the fore-teeth in the lower-jaw are fix: *ibid.* n° 5. The fixth and laft order is that of the jumenta, the teeth of which are few in number, and difpofed in an irregular manner, quite different from that of any of the five preceding orders: *ibid.* n° 6. See the article ANTHROPOMORPHA, *&c.*

QUADRUPLATORES, among the Romans, were informers, who had the fourth-part of the confifcated goods for their pains.

QUADRUPLE, a fum or number multiplied by four or taken four times.

This word is particularly ufed for a gold-coin worth four times as much as that whereof it is the quadruple.

QUÆ EST EADEM, in law, words ufed in pleadings, to fupply the want of traverfe; as where a defendant juftifies a trefpafs or an affault at another day or place than is fpecified in the plaintiff's declaration, he ought to fay, *quæ eft eadem tranfgreffio*, &c.

QUÆ PLURA, in law, was formerly a writ that lay where an inquifition had been taken by an efcheator, of fuch lands, *&c.* whereof a perfon died feifed, and it was fuppofed that all the lands were not found by the inquifition.

QUÆ SERVITIA, a writ relating to fervices, *&c.*

QUÆRE, in law, is where any point is doubted of.

QUESTUS, in law, fignifies whatever a perfon has by purchafe; as hæreditas denotes that which one has by defcent, or hereditary right. See PURCHASE.

QUAIL, *coturnix.* See COTURNIX.

Quails, on being imported, pay a duty of 1 s. 6$\frac{48}{100}$d. the dozen; and draw back, on exportation, 1 s. 4$\frac{20}{100}$d.

QUAKERS, a religious fect which made its firft appearance in England during the interregnum; fo called, in derifion, from certain unufual tremblings with which they were feized at their firft meetings. Their founder was George Fox, a fhoemaker, born at Draiton, in Leicefterfhire; who, as he worked at his trade, ufed to meditate much on the Scriptures: at length he began to fee vifions, and fet up for a preacher. He propofed but few articles of faith, infifting chiefly on moral virtue, mutual charity, the love of God, and a deep attention to the inward motions and fecret operations of the fpirit. He required a plain fimple worfhip, and a religion without ceremonies, making it a principal point to wait in profound filence the directions of the Holy Spirit.

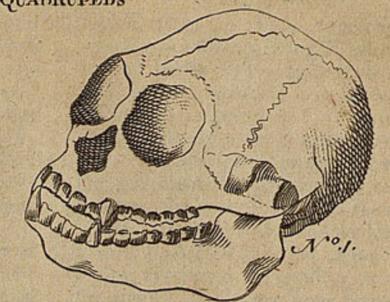
Quakers were at firft guilty of fome extravagancies, but thefe wore off, and they fettled into a regular body, profeffing great aufterity of behaviour, a fingular probity and uprightnefs in their dealings, a great frugality at their tables, and a remarkable plainnefs and fimplicity in their drefs.

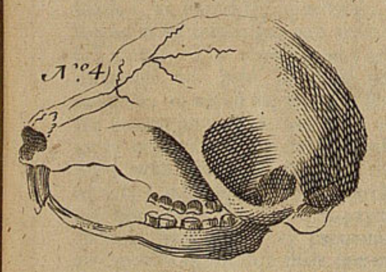
The fyftem of the quakers is laid down in fifteen thefes, by Robert Barclay, in a fenfible, well wrote apology, addreffed to Charles II. Their principal doctrines are, That God has given to all men, without exception, fupernatural light, which being obeyed can fave them; and that this light is Chrift, the true light, which lighteth every man that cometh into the world: that the Scriptures were indeed given by infpiration, and are preferable to all the other writings in the world; but that they are no more than fecondary rules of faith and practice, in fubordination to the light or fpirit of God, which is the primary rule: that immediate revelation is not ceafed, a meafure of the fpirit being given to every one: that all fuperftitions and ceremonies in religion of mere human inftitution, ought to be laid afide; as alfo, in civil fociety, the faluting one another by pulling off the hat, bowing, or the like; and the faying *you* inftead of *thou*, to a fingle perfon: that men and women ought to be plain and grave in their apparel, fober and juft in their whole converfation, and, at a word, in all their dealings; and not to fwear, to go to war, to fight in private quarrels, or even to bear any carnal weapons. They alfo entirely fet afide the two facraments, baptifm and the lord's fupper; admit no clergy among them, but any one, without diftinction, who is of a fober life,

and

Fig. 1. QUADRUPEDS







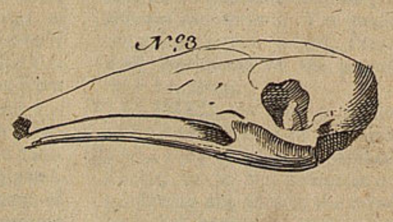






Fig. 3. QUINCUNX

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Fig. 2 QUARTERING

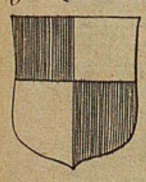


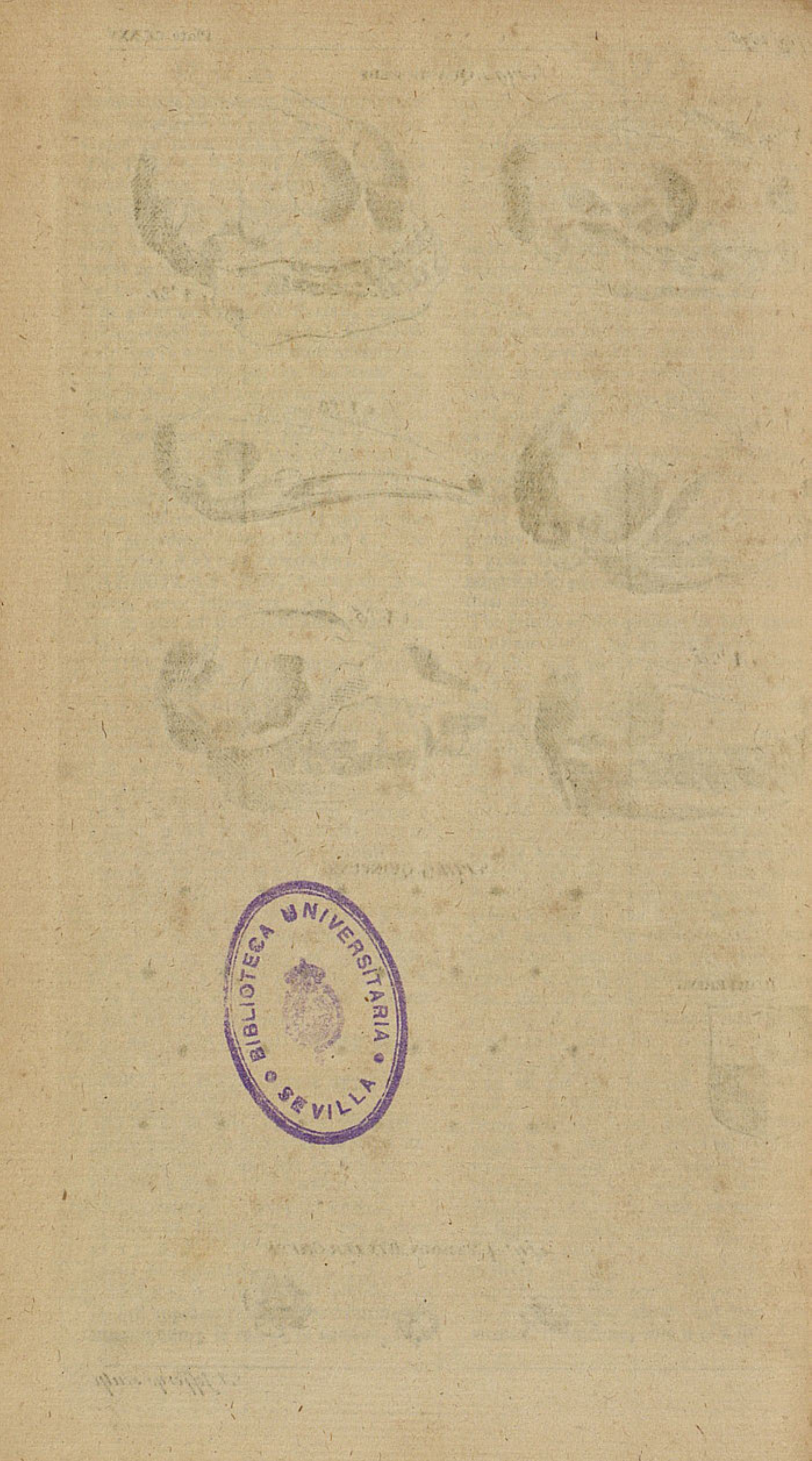
Fig. 4. PYROLA, *WINTER-GREEN*







T. Jefferys sculp


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and believes him or herself to be moved thereto by the spirit, is allowed to preach in their assemblies; and they hold it unlawful to pay tythes, or church-rates. In short, they are a quiet inoffensive people, of exemplary morals, remarkably charitable and friendly to each other, and have never yet been guilty of persecution, though they have had it in their power.

As to discipline and polity, the affairs of the community are managed in their assemblies, of which there are several kinds; as monthly, quarterly, yearly, second days meetings, and meetings of sufferings. The monthly and quarterly meetings are held in their respective counties, to which deputies are sent from the several particular meetings, and enquiry is made into the state of each meeting; who violate the laws of the community; who pay tythes or church-rates, and who suffer for the non-payment of either: here too they excommunicate and receive again into their communion. Of all which registers are kept.

From these meetings appeals lie to their yearly assemblies, which are always held in London, and consist of three orders or classes; representatives sent from the quarterly meetings, correspondents from foreign countries and the several counties, and preachers. Hither are transmitted accounts of what has been transacted in all the monthly and quarterly meetings: here measures are concerted, and directions given as to behaviour about tythes, rates, &c. and here they compose differences and make provision for the poor: Here public accounts are audited, and instructions given to the deputies to be observed at their return; and from hence a yearly epistle of admonition is dispatched to be read in all the monthly and quarterly meetings.

The second day's meeting is a standing committee, consisting of the principal preachers in and about the city, who meet every monday to consider of particular cases and exigencies which happen between the yearly meetings.

The meeting of sufferings is held every week, and consists of the correspondents for each county. Its business is to receive complaints for such as have suffered for non-payment of tythes and church-rates, and to procure them relief, either by sending them money, for which they have a settled fund, or by soliciting their cause, or both.

QUALE JUS, in law, a judicial writ which was antiently brought, where a religious person had judgment to recover land before execution was made of the judgment; in which case, it went out to the escheator in order to inquire, whether the person had right to recover, or whether the judgment was obtained by collusion between the demandant and the tenant, with an intention to defraud the lord, &c.

QUALIFICATOR, in the canon-law, a divine appointed to qualify, or declare the quality of a proposition brought before an ecclesiastical tribunal, chiefly before the inquisition. The qualificators of the office are not judges, they only give their sentiments on the proposition presented to them.

QUALIFIED, in law, a person enabled to hold two livings or benefices.

QUALITY, *qualitas*, is defined by Mr. Locke, to be the power in a subject of producing any idea in the mind: thus a snow-ball having the power to produce in us the ideas of white, cold, and round, these powers, as they are in the snow-ball, he calls qualities; and as they are sensations, or perceptions, in our understandings, he calls ideas. See IDEA.

These qualities, according to the same philosopher are of two sorts; first, original or primary qualities, are those inseparable from body, and such as it keeps in all its changes and situations: these are solidity, extension, motion or rest, number and figure: thus, take a grain of wheat, divide it into two parts, each has solidity, extension, figure, mobility; divide it again and it still retains the same qualities, and will do so still, though you divide it on till the parts become insensible. Secondly, secondary qualities are such, whatever reality we by mistake may attribute to them, as in truth are nothing in the objects themselves, but powers to produce various sensations in us, and depend on the qualities before-mentioned; such are colours smells, tastes, sounds, &c.

The ideas of primary qualities of bodies, are resemblances of them, and their patterns really exist in bodies; but the ideas produced in us by secondary qualities have no resemblance of them at all: and what is sweet, blue, or warm, in the idea, is but the certain bulk, figure and motion of the insensible parts in the bodies themselves which we call so: thus we see that fire at one distance produces in us the sensation of warmth,

warmth, which at a nearer approach caufes the fenfation of pain. Now what reafon have we to fay that the idea of warmth is actually in the fire, but that of pain not in the fire, which the fame fire produces in us the fame way. The bulk, number, figure, and motion of the parts are really in it, whether we perceive them or no, and therefore may be called real qualities, becaufe they really exift in that body; but light and heat are no more really in it than pain or ficknefs: take away the fenfation of them, let not the eyes fee light or colours, nor the ear hear founds, let the palate not tafte, nor the nofe fmell, and all colours, taftes, odours, and founds, as they are fuch particular ideas, vanifh and ceafe, and are reduced to their caufes, *i. e.* bulk, motion, figure, *&c.* of parts.

Thefe fecondary qualities are of two forts; firft, immediately perceivable, which by immediately acting on our bodies, produce feveral different ideas in us. Secondly, mediately perceivable, which, by operating on other bodies, change their primary qualities fo as to render them capable of producing ideas in us, different from what they did before. Thefe laft are powers in bodies, which proceed from the particular conftitutions of thofe primary and original qualities, to make fuch a change in the bulk, figure texture, *&c.* of another body, as to make it operate on our fenfes differently from what it did before; as in fire, to make lead fluid: thefe two laft being nothing but powers relating to other bodies, and refulting from the different modifications of the original qualities, are yet otherwife thought of; the former being efteemed real qualities, but the latter barely powers. The reafon of this miftake feems to be this, that our ideas of fenfible qualities, containing nothing in them of bulk, figure, *&c.* we cannot think them the effect of thofe primary qualities, which appear not to our fenfes to operate in their productions, and with which they have not any apparent congruity; nor can reafon fhew how bodies, by their bulk, figure, *&c.* fhould produce in the mind the ideas of warm, yellow, *&c.* but in the other cafe, when bodies operate upon one another, we plainly fee that the quality produced hath commonly no refemblance with aught in the thing producing it, and therefore we look upon it as the effect of power: but our fenfes not being able to difcover any unlikenefs between the idea produced in us, and the quality of the object producing it, we imagine that our ideas are refemblances of fomething in the objects, and not the effects of certain powers placed in the modification of the primary qualities, with which primary qualities the ideas produced in us have no refemblance.

Secondary qualities, for the moft part, ferve to diftinguifh fubftances; for our fenfes fail us in the difcovery of the bulk, figure, texture, *&c.* of the minute parts of bodies, on which their real conftitutions and differences depend: and fecondary qualities are nothing but powers with relation to our fenfes. The ideas that make our complex ones, of corporeal fubftances are of three forts: firft, the ideas of primary qualities of things, which are difcovered by our fenfes: fuch are bulk, figure, motion, *&c.* fecondly, the fenfible fecondary qualities, which are nothing but powers to produce feveral ideas in us, by our fenfes; thirdly, the aptnefs we confider in any fubftance, to caufe or receive fuch alterations of primary qualities, as that the fubftance, fo altered, fhould produce in us different ideas from what it did before: and they are called active or paffive powers. The mind can have no other idea of fenfible qualities, than what comes from without, by the fenfes; nor any other idea of the operations of a thinking fubftance, than what it finds in itfelf; and as of two primary qualities of body, *viz.* folid coherent parts, and impulfe, we have clear and diftinct ideas, fo likewife have we of two primary qualities of fpirit, *viz.* thinking, and a power of action: and as we have clear and diftinct ideas of feveral qualities inherent in bodies, which are but the various modifications of the extenfion of cohering folid parts, and their motion; fo we have likewife the ideas of the feveral modes of thinking, *viz.* believing, doubting, hoping, fearing, *&c.*

Chemical QUALITIES, thofe qualities principally introduced by means of chemical experiments, as fumigation, amalgamation, cupellation, volatilization, precipitation, *&c.*

To thefe chemical qualities fome others might be added, which, becaufe of the ufe which phyficians principally make of them, may be called medical qualities; whereby fome fubftances, received into the human body, are refolving, difcuffing, abfterfive, *&c.*

QUALITY is alfo ufed for a kind of title given to certain perfons, in regard of their

their territories, ſignories, or other pretenſions.

QUAM DIU SE BENE GESSERIT, a clauſe frequently to be found in letters patent of the grant of offices, as in thoſe to the barons of the exchequer, &c. where it intimates that they ſhall hold the ſame as long as they ſhall behave themſelves well. It is ſaid, that theſe words intend what the law would imply, if an office were granted during life.

QUAMSI, a province of China, bounded by the province of Yunan on the weſt, by Queycheu on the north, by Quamtum on the eaſt, and by Tonquin on the ſouth.

QUAMTUM, or CANTON, a province of China, bounded by Huguam and Kiamſi on the north, by Foken on the eaſt, by the ocean on the ſouth, and by Quamſi on the weſt.

QUANTITY, *quantitas*, any thing capable of eſtimation, or menſuration; or which, being compared with another thing of the ſame kind, may be ſaid to be greater or leſs than it, equal or unequal to it.

Mathematics is the ſcience or doctrine of quantity, which being made up of parts, is capable of being made greater or leſs. It is increaſed by addition, and diminiſhed by ſubſtraction; which are therefore the two primary operations that relate to quantity. Hence it is that any quantity may be ſuppoſed to enter into algebraic computations two different ways, which have contrary effects, *viz.* either as an increment or as a decrement. See the articles ADDITION and SUBSTRACTION.

As addition and ſubſtraction are oppoſite, or an increment is oppoſite to a decrement, there is an analogous oppoſition between the affections of quantities that are conſidered in the mathematical ſciences; as between exceſs and defect, between the value of effects or money due to a man, and money due by him; a line drawn towards the right, and a line drawn towards the left; gravity, and levity; elevation above the horizon, and depreſſion below it. When two quantities equal in reſpect of magnitude, but of thoſe oppoſite kinds, are joined together, and conceived to take place in the ſame ſubject, they deſtroy each other's effect, and their amount is nothing. A power is ſuſtained by an equal power, acting on the ſame body with a contrary direction, and neither have effect. When two unequal quantities of thoſe oppoſite qualities are joined in the ſame ſubject, the greater prevails by their difference; and when a greater quantity is taken from a leſſer of the ſame kind, the remainder becomes of the oppoſite kind. When two powers or forces are to be added together, their ſum acts upon the body; but when we are to ſubſtract one of them from the other, we conceive that which is to be ſubſtracted, to be a power with an oppoſite direction; and if it be greater than the other, it will prevail by the difference. This change of quality only takes place where the quantity is of ſuch a nature as to admit of ſuch a contrariety or oppoſition. We know nothing analogous to it in quantity abſtractly conſidered, and cannot ſubſtract a greater quantity of matter from a leſſer, or a greater quantity of light from a leſſer; and the application of this doctrine to any art or ſcience, is to be derived from the known principles of the ſcience. See the articles ALGEBRA, GEOMETRY, &c.

A quantity that is to be added, is called a poſitive quantity; and a quantity to be ſubſtracted, is ſaid to be negative. See POSITIVE and NEGATIVE.

Quantities are ſaid to be like or ſimilar, that are of the ſame denomination, or are repreſented by the ſame letter or letters, equally repeated: but quantities of different denominations, or repreſented by a different letter or letters, are ſaid to be unlike or diſſimilar. A quantity conſiſting of more than one term is called a compound quantity; whereas that conſiſting of one term only is denominated a ſimple quantity.

The quantity of matter in any body, is the product of its denſity into its bulk; or a quantity ariſing from the joint conſideration of its magnitude and denſity; as if a body be twice as denſe, and take up twice as much ſpace as another, it will be four times as great. This quantity of matter is beſt diſcoverable by the abſolute weight of bodies. See GRAVITY.

The quantity of motion in any body is the factum of the velocity into the maſs, or it is a meaſure ariſing from the joint conſideration of the quantity of matter, and the velocity of the motion of the body; the motion of any whole being the ſum or aggregate of the motion in all its ſeveral parts. Hence, in a body twice as great as another, moved with an equal velocity, the quantity of motion is double; if the velocity be double alſo, the quantity of motion will be quadruple. Hence, the quantity of motion is the ſame with what we call the momentum or impetus

petus of a moving body. See MOTION.

Combination of QUANTITIES. See the article COMBINATION.

Commensurable QUANTITIES. See the article COMMENSURABLE.

Exponential QUANTITY. See the article EXPONENTIAL.

Infinite QUANTITIES. See INFINITE QUANTITIES and INFINITESIMALS.

Transcendental QUANTITIES. See the article TRANSCENDENTAL.

Variable QUANTITIES. See VARIABLE.

QUANTITY, in grammar, an affection of a syllable, whereby its measure, or the time wherein it is pronounced, is ascertained; or that which determines the syllable to be long or short. See the articles MEASURE and SYLLABLE.

Quantity is also the object of prosody, and distinguishes verse from prose; and the œconomy and arrangement of quantities, that is, the distribution of long and short syllables, make what we call the number. See PROSODY, VERSE, and NUMBER. The quantities are used to be distinguished, among grammarians, by the characters ◡, short, as pĕr; and —, long, as rōs. There is also a common, variable, or dubious quantity; that is, syllables that are one time taken for short ones, and at another time for long ones as the first syllable in *Atlas, patres, &c.* Feet are made up of quantities. See FOOT. The quantity of a syllable is either natural or accidental: natural quantity is that taken from the nature of the vowel, as *re* in *resisto* is short, and *de* in *depello*, is long. Accidental quantity is that departing from the natural quantity, merely by accident, as *re* in *restiti* is long, because it is immediately followed by two consonants; and *de* in *deamo* is short, because it immediately precedes a vowel.

The quantity of syllables is known two ways. 1. By rules for that purpose. And, 2. By authority. The rules for this end are taught by that part of grammar called prosody; the authority made use of in this case is no more than examples from, or the testimony of, approved authors; and is never used but either when the rules are deficient, or when we are unacquainted with them. The quantity of the syllables is but little fixed in the modern tongues; and there is still less regard had to it in the composition of modern verses. The want of feet, or rather the shortness and uniformity of our feet, makes a world of difference between the numbers of the antient and modern verse. The antients subsisted by their quantities alone; so well were they distinguished, and such a harmony did they produce. Our quantities make such poor music, that we are generally forced to call in the gothic aid of rhyme, to distinguish our verse from prose.

QUANTITY *of a degree.* See DEGREE.

QUANTUM MERUIT, in law, is an action upon the case, founded on the necessity of paying a person, for doing any thing as he deserves.

QUARANTAIN, QUARENTINE, or QUARANTENA, in old law books, denotes the space of forty days. It also signifies a benefit allowed to the widow of a man dying seised of lands, *&c.* by which she may challenge to continue in his capital messuage, or chief mansion-house, so it be not a castle, for the space of forty days after his decease. And if the heir or any other person eject her, she may have the writ de quarantena habenda.

QUARANTAIN is more particularly used for a term of forty days, which vessels, coming from places suspected of contagion, are obliged to wait in certain places appointed to air themselves, before they come into port. See the article LAZAR-HOUSE.

Quarantain, also signifies a measure or extent of land, containing forty perches.

QUARANTAIN *of the king*, in France, denotes a truce of forty days appointed by St. Louis, during which it was expressly forbid to take revenge on the relations or friends of people, who had fought, wounded, or affronted each other in words.

QUARE, in law, a term affixed to the title of several writs: as 1. Quare ejecit infra terminum, is a writ that lies for a lessee cast out of his farm before his term is expired. 2. Quare impedit, a writ that lies for a person that has purchased an advowson, against him who disturbs him in the right thereof, by presenting a clerk to it when the church is vacant. This writ differs from what is called a darrein presentment, because that is brought where a person or his ancestors formerly presented; but this lies for him that is purchaser himself. Yet in both these writs, the plaintiff recovers the presentation and damages; though the title to the advowson is recovered only by a quare impedit. 3. Quare incumbravit is a writ that lies against a bishop, who within six months after the vacancy of a benefice, confers it on his clerk, while two others are contesting the right of presentation. 4. Quare non admisit, is a writ that lies where any one has recovered an advowson

ſon or preſentation, and ſending his clerk to be admitted, the biſhop refuſes to admit him: in which caſe the perſon that has the preſentation may have this writ againſt the biſhop. 5. Quare non permittit, is a writ that lies for one who has a right to preſent for a turn againſt the proprietary. 6. Quare obſtruxit, is a writ that lies for him who having a right to paſs through another's grounds cannot enjoy the ſame, by reaſon the owner has fenced them up.

QUARREL, *querela*, in law, is generally applied to perſonal and mixed actions, in which the plaintiff is called querens: and hence it is that if a perſon releaſe all quarrels, it is taken to be as beneficial to the releaſee, as if it were a releaſe of all actions; ſince all actions both real and perſonal are thereby releaſed.

QUARREL *of glaſs*. See the next article.

QUARRY, a place under ground, out of which are got marble, free-ſtone, ſlate, lime-ſtone, or other matters proper for buildings.

Quarries of free ſtone, are in many places opened, and the ſtone brought out, in the following manner: they firſt dig a hole in the manner of a well, twelve or fourteen feet in diameter, and the rubbiſh drawn out with a windlaſs in large oſier baſkets, they heap up all around; placing their wheel, which is to draw up their ſtones, upon it. As the hole advances, and their common ladder becomes too ſhort, they apply a particular ladder for the purpoſe. When they have got thro' the earth, and are arrived at the firſt bank or ſtratum; they begin to apply their wheel and baſkets to diſcharge the ſtones as faſt as they dig through them. In freeing the ſtone from the bed, they proceed thus: as common ſtones, at leaſt the ſofter kinds, have two grains, a cleaving grain, running parallel with the horizon, and a breaking grain, running perpendicular thereto; they obſerve by the grain where it will cleave, and there drive in a number of wedges, till they have cleft it from the reſt of the rock. This done, they proceed to break it; in order to which applying the ruler to it, they ſtrike a line, and by this cut a little channel with their ſtone-ax; and in the channel if the ſtone be three or four feet long, ſet five of ſix wedges, driving them in very carefully with gentle blows, and ſtill keeping them equally forward, Having thus broken the ſtone in length, which they are able to do of any ſize within half an inch, they apply a ſquare to the ſtrait ſide, ſtrike a line, and proceed to break it in breadth. This way of managing ſtone is found vaſtly preferable to that where they are broken at random: one load of the former being found to do the buſineſs of a load and a half of the latter. But it may be obſerved, that this cleaving grain being generally wanting in the harder kinds of ſtones, to break up theſe in the quarries, they have great heavy ſtone-axes; with which they work down a deep channel into the ſtone; and into this channel, at the top, lay two iron-bars between which they drive their iron wedges.

QUARRY or QUARREL, among glaziers; a pane of glaſs cut in a diamond form.

Quarries are of two kinds, ſquare and long, each of which are of different ſizes, expreſſed by the number of the pieces that make a foot of glaſs, *viz.* eighths, tenths, twelfths, eighteenths, and twentieths: but all the ſizes are cut to the ſame angles, the acute angle in the ſquare quarrels being 77° 19′ and 67° 21′ in the long ones.

QUARRY, among hunters, is ſometimes uſed for a part of the intrails of the beaſt taken, given by way of reward to the hounds.

QUARRY, in falconry, the game which the hawk is in purſuit of, or has killed,

QUART, a meaſure containing the fourth part of ſome other meaſure. See the article MEASURE.

The engliſh quart is the fourth part of a gallon, or two pints. See the articles GALLON and PINT.

QUARTAN, *quartana*, in medicine, a ſpecies of intermitting fever, wherein the patient has two fits in four days, or two days quite free from a fit.

It uſually begins about four or five in the afternoon, ſometimes ſooner and ſometimes later, with a great laſſitude, ſtretching, a blunt pain in the head, back, loins, and legs; the feet and hands are cold, and the whole body is pale; and the face and nails livid, to which ſhivering and ſhaking ſupervene. The tongue and the lips tremble, the breathing is difficult, with reſtleſſneſs, and toſſing; the pulſe is contracted and hard, and ſometimes unequal; and there is an anxiety about the præcordia. Theſe ſymptoms continue about two or three hours; and in ſome the body is coſtive, whereas in others there is a ſtimulus to ſtool, and to make water; in ſome again, there is a nauſea or vomiting, with ſtools; and ſome advanced in years, have their minds pretty much diſturbed. The heat

heat comes on gradually, not burning but dry; the pulse becomes equal, quick, and large, but the dull pain in the head remains, with a vertiginous affection; the skin becomes only a little moist; and and in about four or six hours, the symptoms vanish except a dull pain in the bones, joints, and feet. The urine in the fit is sometimes thin and watery, and sometimes thick with a sediment.

From the experiments of Dr. Langrish it appears, that the blood is more dense and tenacious in quotidians than in tertians, and in tertians than in quartans. See QUOTIDIAN and TERTIAN.

As to the cure, a vomit should be given after the first fit, in the time of intermission: in tender constitutions, ipecacuanha may be given alone, or two ounces of vinum ipecacuanhum; but to the more robust, a grain or two of emetic tartar may be added, to be taken in warm water about two hours after the paroxysm. The evacuation should be facilitated by taking large draughts of water-gruel made fat with fresh butter. Then take the following electuary, which will crush the disease in the bud: *viz.* take of rob of elder, one ounce; of peruvian bark, five drams; of the powder of common chamomile-flowers, two drams; of the extract of lesser centaury, and powder of clove-julyflowers, each half a dram; and as much syrup of lemons as is sufficient to reduce them to the form of an electuary. The dose is half a dram, to be taken every two hours after the fit.

If any thing forbids vomiting, the cure must be begun with detersive and aperient salts, as vitriolated tartar, salt ammoniac, purified nitre, and crab's eyes; and if the ague still continue notwithstanding the repeated use of these salts, then an equal weight of peruvian bark must be added to them, or the above electuary may be given.

When the patient is subject to the hypochondriac passion, the stomach is inflated, and the body costive; then neither vomits nor salts must be ventured upon, but carminative and emollient clysters.

In obstinate quartans, Hoffman greatly commends the following medicine: take of peruvian bark, three drams; of medicinal regulus of antimony, two drams; of mercurius dulcis, which is not to be triturated with the powder, on account of the salts, but only mixed with the point of a knife) of the finest crocus martis, and of vitriolated nitre, each one dram; and of oil of mint, four drops: make up all these into a powder, of which half a dram, or a dram, may be taken, made into the form of a bolus with rob of elder, and syrup of clove-julyflowers.

This method is confirmed by Huxham, who says the bark frequently proves ineffectual, without the help of proper alexipharmics; as snake-root of Virginia, contrayerva, myrrh, camphor, *&c.* After four or five paroxysms, warm chalybeates may be added with very great success; but when the patient's complexion has a yellow cast, and he has a tense abdomen, and very costive habit of body, mercurial, saponaceous deobstruents with rhubarb, aloetics, or sal diureticus should be premised to, or joined with the bark.

Hoffman observes, that obstinate quartans in boys are not to be cured but by purging; and therefore he directs the following form: take of cream of tartar, one dram; of calyx of antimony, twelve grains, of sulphurated diagrydium, six grains; make them into a powder, which may be taken in three doses, the first six hours before the fit, the second before the next fit, and the third before the third fit. After this, he orders an infusion of half an ounce of peruvian-bark in eight ounces of fennel water; adding the bark of Eleutherius, sal diureticus, and salt of tartar, of each one dram, together with half an ounce of syrup of clove-julyflowers; a spoonful of which should be taken every two hours.

To prevent the return of an ague, the bark must be repeated every week or ten days, for three several times, with the same intervals. Likewise bitters and chalybeates are very serviceable, taken either together or separately.

QUARTATION, in metallurgy, a method of purifying gold, by melting three parts of silver with one of gold, and then throwing the mixture into aqua-fortis. See the article ASSAYING.

Experience has taught us, says Cramer, that aqua-fortis dissolves silver mixed with gold quickly enough, when the gold constitutes but one, and the silver three parts of a mixed mass of them: and in this case, if the solution is not too impetuously performed, the gold usually remains in such a proportion, in the same figure that the whole mass had before the separation of the silver by this menstruum; so that in this case, there is no reason to apprehend the gold's being torn into minute particles, and dissipated in some measure; though this can hardly be prevented when the silver exceeds the three

three quarter proportion, in regard to the gold in the mass. The artificers therefore, always make it their study to observe very exactly this proportion of the gold being one fourth part of the mixture; and thence it is that the operation itself has been called quartation. From this operation we may learn how fallacious the examination made with aqua fortis alone of the gold rubbed on the touchstone, must necessarily prove.

QUARTER, *quadrans*, the fourth part of any thing, the fractional expression for which is $\frac{1}{4}$. See the article FRACTION.

Quarter, in weights, is generally used for the fourth part of an hundred weight averdupois, or 28 ℔. See WEIGHT.

Used as the name of a dry measure, quarter is the fourth part of a ton in weight, or eight bushels. See the articles MEASURE and TUN.

QUARTER, in law, the fourth part of a year; and hence the days on which these quarters commence, are called quarter-days *viz.* March 25, or Lady-day; June 24, or Midsummer-day; September 29, or Michaelmas; and December 21, or St. Thomas the apostle's day. On these days rents on leases, *&c.* are usually reserved to be paid; though December 25, or Christmas-day, is commonly reckoned the last quarter-day.

QUARTER, in astronomy, the fourth part of the moon's period: thus, from the new moon to the quadrature is the first quarter; from this to full moon, the second quarter, *&c.* See the article PHASIS and MOON.

QUARTER, in heraldry, is applied to the parts or members of the first division of a coat that is quartered, or divided into four quarters. See QUARTERING.

Franc-QUARTER, in heraldry, is a quarter single or alone; which is to possess one fourth part of the field.

This makes one of the honourable ordinaries of a coat.

QUARTER *of a point*, in navigation, is the fourth part of the distance between two cardinal points, which 2° 48′.

QUARTER of a ship is that part of a ship's hold, which lies between the steerage-room and the transom.

Close QUARTERS, in a ship, those places where the seamen quarter themselves, in case of boarding, for their own defence, and for clearing the decks, *&c.*

QUARTER-DECK. See DECK.

QUARTER-MASTERS, or QUARTEERS, in a man of war, are officers whose business it is to rummage, stow, and trim the ship in the hold; to overlook the steward in his delivery of victuals to the cook, and in pumping or drawing out beer, or the like. They are also to keep their watch duly, in conning the ship, or any other duty.

QUARTER is also used for a division of a city, consisting of several ranges of buildings, *&c.* separated from some other quarter by a river, great street, *&c.* Such are the twenty quarters of the city of Paris.

Franchise of QUARTERS. See the article FRANCHISE.

QUARTER, in war, is used in various senses, as for the place allotted to a body of troops to encamp upon: thus they say, the general has extended his quarters a great way, *&c.* Quarter also signifies the sparing men's lives: thus it is said, the enemy asked quarter; we gave no quarter.

QUARTER *of an assembly*, is the place of rendezvous, where the troops are to meet, and draw up in a body.

Head QUARTERS, is the place where the general of an army has his quarters, which is generally near the center of the army.

QUARTERS *of refreshment*, is the place to which the troops that have been much fatigued are sent to refresh themselves during a part of the campaign.

Winter QUARTERS, the places in which the troops are lodged during the winter, or their residence in those places.

QUARTER-MASTER, an officer in the army, whose business is to look after the quarters of the soldiers; of which there are several kinds, *viz.* The quarter-master general, whose business is to provide good quarters for the whole army. Quarter-master of horse, he who is to provide quarters for a troop of horse. Quarter-master of foot, he who is to provide quarters for a regiment of foot.

QUARTER, in the manege, as to work from quarter to quarter, is to ride a horse three times in upon the first of the four lines of a square; then changing your hand, to ride him three times upon the second; and so to third and fourth; always changing hands and observing the same order.

QUARTERS, with respect to the parts of a horse, is used in various senses: thus the shoulders and fore-legs, are called the fore-quarters, and the hips and hinder-legs, the hind-quarters. The quarters of a horse's foot, are the sides of the coffin, comprehending between the toe and the heel; the inner quarters, are

thofe oppofite to one another, facing from one foot to the other; and thefe are always weaker than the outfide quarters, which lie on the external fides of the coffin. Falfe quarters, are a cleft in the horn of a horfe's hoof, extending from the coronet to the fhoe. A horfe is faid to be quarter-caft, when for any diforder in the coffin we are obliged to to cut one of the quarters of the hoof.

QUARTERS *of a faddle*, are the pieces of leather or ftuff made faft to the lower part of the fides of a faddle, and hanging down below it.

QUARTERS, in a clock, are the little bells that found the quarters in an hour.

QUARTER-CHORD, in mining, is feven yards and a quarter, which the miner has crofs-ways of his vein, on either fide, for liberty to lay his earth, ftones, and rubbifh on, and to wafh and drefs up his ore.

QUARTERS, in building, are thofe flight upright pieces of timber placed between the puncheons and pofts, ufed to lath upon. Thefe are of two forts, fingle and double; the fingle quarters are fawn to two inches thick, and four inches broad; the double quarters are fawn to four inches fquare. It is a rule in carpentry, that no quarters be placed at a greater diftance than fourteen inches.

QUARTER-ROUND, in architecture, is a term ufed by the workmen for any projecting moulding in general, whofe contour is a perfect quadrant of a circle, or which approaches near that figure.

QUARTER-SESSIONS, a general court held quarterly by the juftices of peace of each county. See JUSTICES *of peace*.

QUARTER-STAFF, a long ftaff borne by forefters, park-keepers, &c. as a badge of their office; and occafionally ufed as a weapon.

QUARTER-WHEELING, or QUARTER *of converfion*, in the military art, is the motion by which the front of a body of men is turned round to where the flank was, by taking a quarter of a circle. If it be done to the right, the man in the right-hand angle keeps his ground and faces about, while the reft wheel; if to the left, the left hand man keeps his place.

QUARTER-WIND, at fea, is a lateral or fide-wind, which does not blow in ftern, but a little afide of it.

This is the beft of all winds, as bearing into all the fails; whereas a wind blowing full in ftern, is kept off by the fails of the mizzen.

QUARTERING, in the fea-language, is difpofing the fhip's company at an engagement, in fuch a manner as that each may readily know where his ftation is, and what he is to do. As fome to the mafter, for the management of the fails; fome to affift the gunners in traverfing the ordnance; fome for plying of the fmall fhot; fome to fill powder in the powder-room; others to carry it from thence to the gunners, in cartridges, &c.

When a fhip under fail goes at large neither by wind, nor before a wind, but, as it were betwixt both, fhe is faid to go quartering.

QUARTERING, in gunnery, is when a piece of ordnance is fo traverfed that it will fhoot on the fame line, or on the fame point of the compafs as the fhip's quarter bears.

QUARTERING, in heraldry, is dividing a coat into four or more quarters, or quarterings, by parting, couping, &c. that is by perpendicular and horizontal lines, &c. Columbiere reckons twelve forts of quarterings, *viz.* party per pale, dividing the efcutcheon from top to bottom; party per crofs, dividing it from fide to fide; party of fix pieces, when the efcutcheon is divided into fix parts; party of ten; of twelve; of fixteen; of twenty; and of thirty-two, when there are fo many partitions. Others give the divifions in another manner: as party per crofs; per pale; per chief; per pale inclave; per bend dexter; per bend finifter; per chevron; barry bendy of eight pieces; paleways of fix pieces; barry of fix pieces; barry of eight pieces; bendy of fix; checky; fufilly, or lozengy; bendy lozengy; barry bendy lozengy, or bend lozengy; gyronny; barry lozengy counterchanged; waved of fix pieces; barry nebule of fix pieces; party per pale, and party per pale in point. See each of which under their refpective articles.

Quartering is alfo applied to the partitions or compartments themfelves; that is, to the feveral coats borne on an efcutcheon, or the feveral divifions made in it, when the arms of feveral families are placed on the fame fhield, on account of intermarriages, or the like.

Quartering is alfo ufed for diftinguifhing younger brothers from the elder.

In blazoning, when the quartering is performed per crofs, the two quarters a-top are numbered the firft and fecond; and thofe at bottom, the third and fourth; beginning to tell on the right fide. When the quartering is by a faltier, &c. the chief and point are the firft and fecond quarters, the right fide the third, and the left

left the fourth. See pl. CCXXV. fig. 2.

Counter-QUARTERING *a coat*, is when the quarters are subdivided each into four. There are counter-quartered coats that have twenty or twenty-five quarters.

QUARTERING, or QUARTERIZATION, is part of the punishment of a traitor, which consists of dividing his body into four quarters.

QUARTERLY, in heraldry. A person is said to bear quarterly, when he bears arms quartered. See QUARTERING.

QUARTERN, a diminitive of quart, signifying a quarter of a pint. See the article MEASURE.

QUARTILE, an aspect of the planets. See the article ASPECT.

QUARTO, or 4to, a book of which four leaves, or eight pages make a sheet.

QUARTO-DECIMANS, *quarto-decimani*, an antient christian sect, so called from their maintaining that the festival of Easter ought to be celebrated, conformably to the custom of the Jews, on the fourteenth day of moon in the month of March, whatever day of the month that happened to be.

QUASHING; in law, the overthrowing and annulling of any thing.

QUASI-CONTRACT, in the civil law, an act which has not the strict form of a contract, but yet has the force of one. Thus if one person does another's business in his absence, without his procuration, and it has succeeded to the other person's advantage; the one may have an action for what he has disbursed, and the other to make him give an account of his administration: which amounts to a quasi-contract.

QUASI-CRIME, or QUASI-DELICT, in the civil law, is the act of doing a person an injury, involuntarily; which is to be repaired by making good the damage with interest.

QUASI MODO SUNDAY, or LOW EASTER SUNDAY, the next Sunday after Easter: so called from the beginning of the introit of the mass for the day, *quasi modo geniti infantes*.

QUATER-COUSINS, fourth cousins, or the last degree of kindred.

QUATRE-NATIONS, four nations, the name of a college founded by cardinal Mazarin, for the education and maintenance of sixty children natives of the four countries conquered by the king, *viz.* Pignerol, Alsatia, Flanders, and Roussillon.

QUATUOR VIR, in antiquity, formerly written IIII. VIR, a roman magistrate who had three colleges joined with him in the same administration, and had the care of conducting and settling the colonies sent into the provinces.

There were also quatuor-viri appointed to inspect and take care of repairs, *&c.*

QUAVER, in music, a measure of time equal to half a crotchet, or an eighth of a semibreve.

The quaver is divided into two semiquavers, and four demisemiquavers. See the article CHARACTERS *in music*.

QUAVERING, in music, trilling or shaking; or the running a division with the voice.

QUAY, or KAY. See the article WHARF.

QUEBEC, the capital of Canada, in North America, situated on the west side of the river of St. Lawrence, 300 miles north-west of Boston in New England: west long. 74°, north lat. 47° 5'.

QUEEN, *regina*, a woman who holds a crown singly.

The title of queen is also given by way of courtesy to her that is married to a king, who is called by way of distinction queen-consort; the former being termed queen-regent. The widow of a king is also called queen; but with the addition of dowager.

A queen-regent is in the construction of law the same with a king, and has the same power in all respects. See KING.

A queen-consort is inferior to the king, and is really his subject, though, as the king's wife, she has several prerogatives above other women. Though an alien, she may purchase lands in fee-simple, without either naturalization or denization. She may present to a benefice. She shall not be amerced if she be nonsuited in any action; and may not be impleaded till first petitioned. To conspire her death, or violate her chastity, is high treason. She has an antient peculiar revenue called queen-gold; besides a very large dower, with a royal court, and officers of her own. No person here must marry a queen-dowager without the licence of the succeeding king, on pain of forfeiting his lands and goods: but tho' she marry any of the nobility, or even one under that degree, she does not lose her dignity.

QUEEN'S COUNTY, a county of Ireland, bounded by King's county, on the north; by Kildare, on the east; by Kilkenny, on the south; and by the province of Munster, on the west.

QUEEN'S FERRY, a town of Scotland, on the

the south side of the river Forth, ten miles west of Edinburgh.

QUEEN'S GOLD, a royal revenue that belongs to the queen of England, during her marriage to the king, and payable by divers persons upon several grants of the king, by way of oblation, out of fines amounting to ten marks, or upwards, *viz.* one tenth part above the intire fine, or ten pounds for every hundred pounds fine, on pardons, contracts, or agreements; which become a real debt to the queen, on the party's bare agreement with the king for his fine, and recording it, without any farther promise or contract.

QUEENBOROUGH, a borough town of the isle of Sheppy, in Kent, twelve miles north-west of Canterbury.

It sends two members to parliament.

QUE-ESTATE, in law, a plea whereby a man intitling himself to land, *&c.* says, that the same estate which another had, he now has from him.

QUE EST MEME, in law, is a term used in actions of trespass, *&c.* for a direct and positive justification of the very act complained of by the plaintiff.

QUERCUS, the OAKTREE, in botany. See the article OAK.

QUERCY, the south-east division of the province of Guienne, in France, having Limosin on the north, and Languedoc on the south.

QUERELA, in law, an action or complaint exhibited in any court of justice. See the article QUARREL.

QUERELA AUDITA. See the article AUDITA QUERELA.

QUERELA CORAM REGE ET CONCILIO, is a writ by which a person is called to justify a complaint of a trespass made to the king himself, before the king and his council.

QUERIA, in botany, a genus of the triandria trigynia class of plants; the calyx of which is an erect, five leafed perianthium: it has no corolla; the fruit is a roundish capsule, consisting of three valves, and containing only one cell; the seed is single.

QUERRIES, or EQUERRIES. See the article EQUERRY.

Gentleman of the QUERRY, an officer appointed to hold the king's stirrup, when he mounts on horseback.

QUEST, or INQUEST, an inquiry upon the oaths of an impannelled jury. See the article INQUEST.

QUEST, in hunting, the seeking out of hounds, or the venting or winding of spaniels.

QUESTION, *quæstio*, in logic, a proposition proposed by way of interrogation. See the article PROPOSITION.

QUESTOR, or QUÆSTOR, in roman antiquity, an officer who had the management of the public treasure.

The questorship was the first office any person could bear in the commonwealth, and gave a right to sit in the senate.

At first there were only two; but afterwards two others were created, to take care of the payment of the armies abroad, of the selling plunder, booty, *&c.* for which purpose they generally accompanied the consuls in their expeditions; on which account they were called peregrini, as the first and principal two were called urbani.

The number of questors was afterwards greatly increased. They had the keeping the decrees of the senate: and hence came the two offices of questor principis, or augusti, sometimes called candidatus principis, whose office resembled in most respects that of our secretaries of state; and the quæstor palatii, answering in a great measure to our lord chancellor.

QUEUE, in heraldry, signifies the tail of a beast: thus if a lion be borne with a forked tail, he is blazoned doubled queued.

QUEUE D'ARONDE, or SWALLOW'S TAIL, in fortification, an out-work which is narrower at the gorge than at the front or face, being so called from its resemblance to a swallow's tail.

Of this kind are some single as well as double tenailles, and some horn-works whose sides are not parallel. See the articles TENAILLE and HORN-WORK.

When the front is narrower than the gorge, the work is denominated a contre queue d'aronde.

In carpentry, a queue d'aronde is more generally known by the name of dovetail. See the article DOVE-TAILING.

QUIA IMPROVIDE, in law, a supersedeas issued on the behalf of a clerk of the court of chancery, sued contrary to the privilege of that court in the common pleas, and prosecuted to the exigent; and in several other cases, where a writ is erroneously sued.

QUICK, or QUICKSET HEDGE, amongst gardeners, denotes all live hedges, of whatever sort of plants they are composed, to distinguish them from dead hedges: but in a more strict sense of the word, it is restrained to those planted with the hawthorn, or mespilus sylvestris; under which name these young plants, or sets, are sold by the nursery-gardeners who

who raise them for sale. See Hedge.

Quick beam, *sorbus sylvestris*. See the article Sorbus.

Quick-silver, in natural history, a ponderous mineral fluid, more usually called mercury. See the article Mercury.

QUID, a term used in the schools for the definition of a thing; which is thus called, as answering to the question, *quid est?* what is it. See Definition.

Quid juris clamat, in law, a judicial writ which issues out of the record of a fine that remains with the custos brevium, before the same is engrossed; and it lies for the grantee of a reversion or remainder, where the particular tenant will not attorn.

Quid pro quo, in law, is the mutual consideration and reciprocal performance of both parties to a contract; as the giving one thing of value, for another of the like; and whatever contract is contrary thereto, the law terms it nudum practum.

Quid pro quo is also used, in a physical sense, to express a mistake of an apothecary, in administring one medicine for another; or in using a different ingredient in a composition from that prescribed. See the article Prescription.

QUIDDANY, or Quiddeny, in pharmacy, conserve of quinces. See the articles Quince and Marmalade.

QUIDDITY, *quidditas*, a barbarous term used in the schools for essence. See the articles Essence and Definition.

And hence what is essential to a thing, is said to be quiddative.

QUIETARE, in law, a term frequently met with in old deeds and conveyances, signifying to acquit, release, or discharge. See the article Quietus.

QUIETISTS, a religious sect, which made a great noise towards the close of the last century.

They were so called from a kind of absolute rest and inaction, which they supposed the soul to be in when arrived at that state of perfection which they called the unitive life; in which state, they imagined the soul wholly employed in contemplating its God, to whose influence it was entirely submissive, so that he could turn and drive it where and how he would. In this state, the soul no longer needs prayers, hymns, *&c.* being laid, as it were, in the bosom, and between the arms of its God, in whom it is in a manner swallowed up.

The mahometans seem to be no strangers to quietism. They expound a passage in the seventieth chapter of the Koran, viz. *O thou soul, which art at rest, return unto thy Lord*, &c. of a soul, which having, by pursuing the concatenation of natural causes, raised itself to the knowledge of that being which produced them, and exists of necessity, rests fully contented, and acquiesces in the knowledge, *&c.* of him, and in the contemplation of his perfections.

QUIETUS, in law, is the same as freed or acquitted; being used by the clerk of the pipe, and auditors in the exchequer, in their discharges given to accounts; which generelly conclude with these words, *abinde recessit quietus*, and is termed a *quietus est*; and being granted to a sheriff, discharges him of all accounts and demands due to the king.

QUILLS, the large feathers taken out of the end of the wing of a goose, crow, *&c.*

Quills are denominated from the order in which they are fixed in the wing, the second and third quills being the best for writing, as they have the largest and roundest barrels.

Crow-quills are chiefly used for drawing. In order to harden a quill that is soft, thrust the barrel into hot ashes, stirring it till it is soft, then taking it out, press it almost flat upon your knee with the back of a penknife, and afterwards reduce it to a roundness with your fingers. If you have a number to harden, set water and alum over the fire, and while it is boiling put in a handful of quills, the barrels only, for a minute, and then lay them by.

QUILT, a covering for a bed, formed of two pieces of silk, cotton, *&c.* quilted together.

QUILTING, a method of sewing two pieces of silk, linen, or stuff on each other, with wool or cotton between them; by working them all over in the form of chequer or diamond-work, or in flowers. The same name is also given to the stuff so worked.

QUINARIUS, in roman antiquity, a small coin equal to half the denarius. See the article Coin and Denarius.

QUINCE, *cydonia*, in botany, is comprehended by Linnæus under pyrus. See the article Pyrus.

Quinces, on being imported, pay a duty of 1 s. $6\frac{48}{100}$ d. the hundred; and draw back, on exportation, 1 s. $4\frac{20}{100}$ d.

The syrup of quinces, prepared of their juice with sugar, is an extremely pleasant and cooling medicine. The fruit is also very delicious, but is rough and astringent when eaten raw: it is said to cool and strengthen the stomach, remove nau-

naufeoufnefs, and ftop fluxes of the belly.

QUINCUNX, in roman antiquity, denotes any thing that confifts of five twelfth parts of another, but particularly of the as. See the article UNCIA and AS.

QUINCUNX ORDER, in gardening, a plantation of trees, difpofed originally in a fquare; and confifting of five trees, one at each corner, and a fifth in the middle: or a quincunx is the figure of a plantation of trees, difpofed in feveral rows, both length and breadthwife, in fuch a manner, that the firft tree in the fecond row commences in the center of the fquare formed by the two firft trees in the firft row, and the two firft in the third, refembling the figure of the five at cards. This difpofition of trees was formerly much more regarded than at prefent; but is ftill much ufed in France, for planting trees to form a grove, and is expreffed by the afterifks in plate CCXXV. fig. 3.

QUINCUNX, in aftronomy, an afpect of the planets, when 150° or five figns afunder. See the article ASPECT.

QUINDECAGON, in geometry, a plain figure with fifteen fides and fifteen angles; which, if the fides be all equal, is termed a regular quindecagon, and irregular when otherwife.

The fide of a regular quindecagon infcribed in a circle, is equal in power to the half difference between the fide of the equilateral triangle, and the fide of the pentagon, infcribed in the fame circle; alfo the difference of the perpendiculars let fall on both fides, taken together.

QUINDECEMVIRI, in roman antiquity, a college of 15 magiftrates, whofe bufinefs it was to prefide over the facrifices. They were alfo the interpreters of the Sibyl's books; which, however, they never confulted but by an exprefs order of the fenate.

QUINQUAGENARIUS, in roman antiquity, an officer who had the command of fifty men.

QUINQUAGESIMA SUNDAY, fhrove Sunday, fo called as being about the fiftieth day before Eafter.

QUINQUATRIA, in roman antiquity, feftivals celebrated in honour of Minerva, with much the fame ceremonies as the panathenæa were at Athens. See PANATHENÆA and MINERVALIA.

QUINQUEFOLIUM, CINQUEFOIL, in botany, is comprehended by Linnæus under potentilla. See POTENTILLA.

QUINQUENNALIS, in roman antiquity, a magiftrate in the colonies and municipal cities of that empire, who had much the fame office as the ædile at Rome. See the article ÆDILE.

QUINQUEREMIS, in antiquity, a galley with five rows of oars. See GALLEY.

QUINQUEVIRI, in roman antiquity, an order of five priefts, peculiarly appointed for the facrifices to the dead, or celebrating the rites of Erebus.

QUINQUINA, or QUINAQUINA, in pharmacy, the peruvian, or jefuits-bark, or the bark of the tree called by Linnæus cinchona. See the article CINCHONA.

The peruvian bark fhould be chofen frefh, and of a bright colour, approaching to that of cinnamon, and of a ftrong tafte. The fmaller pieces, in quills, are generally the beft; the larger, and flatter fragments having lefs virtue. We fometimes meet with it cut into thin flices, and of a yellower colour than ordinary: this is the bark of the root, has a very ftrong tafte, and is efteemed by the Spaniards the choiceft of all.

The peruvian bark poffeffes the ftomachic virtues of the other bitters, and that in fo eminent a degree, that it is a queftion whether any of the ftomachics are equal to it: it ftrengthens the ftomach, promotes the appetite, and affifts digeftion; it diffipates flatulencies, and is a very good medicine againft worms. Its great virtue, however, is as a febrifuge: it cures all intermittents fafely and fpeedily, if properly given. Its febrifuge virtue was difcovered to us by the Indians, among whom it had been many ages known, and firft difcovered by a perfon's being cured of an intermittent, by drinking the water of a pond, where fome trees of it had accidentally fallen. It was not difcovered to any body in this part of the world till 1640, when a Spaniard, the governor of the city of Loxa, who had behaved well to fome of thefe people, had the difcovery as a reward. With the new medicine he cured the viceroy's lady of a tertian, after fhe had tried every thing elfe in vain. Hence it was called the countefs's powder. After this, the jefuits brought over a vaft quantity, which was, in 1694, diftributed all over Europe, and did great cures. It was then called pulvis patrum, and jefuits-powder; and the cardinal de Lugo having bought up a vaft quantity of it for the poor and others, it was afterwards called cardinal Lugo's powder.

QUINSEY, or QUINZY. See QUINZY.

QUINTAL, in commerce, the fame with hundred-weight. See WEIGHT.

QUINTESSENCE, *quinta effentia*, in chemiftry,

miſtry, a preparation conſiſting of the eſſential oil of ſome vegetable ſubſtance mixed and incorporated with ſpirit of wine: thus, on a proper quantity, *e. g.* of eſſential oil of fennel, pour twelve times the quantity of pure alcohol diſtilled from alcali, ſo as to contain not the leaſt water: ſhake them together, and the oil will diſappear, and intimately mix with the alcohol, ſo as to form one ſimple and tranſparent liquor. If ſuch quinteſſence be ſeveral times digeſted, cohobated, &c. with a gentle fire, the oil will at length be made ſo volatile as in great meaſure to riſe along with the alcohol: whence oils are rendered more moveable and more ſubtile, and are exhauſted to the higheſt degree of penetrability, like that of ſpirit, though ſtill retaining their native virtues: but if with a fire only of ninety degrees, a mixture of alcohol and theſe oils be diſtilled, the alcohol will riſe by itſelf, or only carry with it the preſiding ſpirit from the oil, leaving the oily part behind; and if with great caution the thinner part be ſeveral times ſeparated from the thicker, by repeated gentle cohobations, the alcohol will at length be ſo impregnated with thoſe ſpirits, as to appear almoſt pure ſpirit itſelf; leaving a groſs exhauſted oil behind.

Quinteſſences thus prepared have great medicinal virtues: thus if a ſingle drop of quinteſſence ſo made with oil of cinnamon, be mixed and drank with a glaſs of ſpaniſh-wine, it inſtantly gives a grateful briſkneſs to the flagging ſpirits, and therefore proves an admirable remedy in in faintings, ſuffocation, and want of ſpirits. All theſe preparations have a great affinity with fire; for being taken inwardly, they heat the body, and if the quantity be large, ſcorch and burn it: when applied externally they produce all the effects of a ſharp inflammation, &c. Dry quinteſſences may be made from the liquid ones; by adding to them ſome more eſſential oils of the ſame vegetable form whence the liquid quinteſſence was procured, with a little ſugar, all mixed together by a gentle heat, till all the moiſture is come over, the matter remaining then is a dry quinteſſence.

QUINTESSENCE, in alchemy, is a myſterious term, ſignifying the fifth, or laſt and higheſt eſſence, or power of a natural body.

QUINTILE, *quintilis*, in aſtronomy, an aſpect of the planets, when they are 72 degrees diſtant from one another, or a fifth part of the zodiac.

QUINTILIANS, a ſect of antient heretics, thus called from their propheteſs Quintilia. In this ſect the women were admitted to perform the ſacerdotal and epiſcopal functions. They attributed extraordinary gifts to Eve for having firſt eaten of the tree of knowledge; told great things of Mary the ſiſter of Moſes, as having been a propheteſs, &c. They added, that Philip the deacon had four daughters who were all propheteſſes and were of their ſect. In theſe aſſemblies it was uſual to ſee the virgins entering in white robes, perſonating propheteſſes.

QUINTIN, or St. QUINTIN, a town of Picardy, in France, 35 miles eaſt of Amiens.

QUINZY, QUINSEY, or ANGINA, in medicine, a pain and inflammation of the fauces, a ſwelling of the uvula, tonſils, and larynx, which being accompanied with a fever, occaſions a difficulty of reſpiration and deglutition. This diſeaſe generally prevails about the latter end of ſpring or beginning of ſummer. When the ſwelling pain and redneſs appear moſtly on the outſides, it is, according to Hoffman, the prognoſtic of a happy ſolution of the diſeaſe: but when the external ſwelling ſuddenly diſappears, without a mitigation of the ſymptoms, it ſhews the morbific matter to be tranſlated elſewhere, and that the diſeaſe will change to a phrenzy, or peripneumony. This diſeaſe may alſo terminate in a ſuppuration, gangrene, or ſchirrus. A frothing at the mouth, the tongue vaſtly ſwelled, and of a purple, blackiſh colour, portend death.

The quinzy is generally diſtinguiſhed by modern writers into the idiopathic and ſymptomatic. The firſt, where it is itſelf the diſeaſe, and owes its origin only to a plethora; the ſecond, where it is but the accidental ſymptom of an inflammatory fever, or ſome other diſeaſe, about the time of its criſis. See the article INFLAMMATORY FEVERS.

Dr. Mead diſtinguiſhes the quinzy into three ſorts; the firſt of which he calls the watery quinzy; the ſecond, a gangrene of the tonſils; and the third a ſtrangulation of the fauces. In the firſt ſort, the glands of the mouth, palate, and neighbouring parts are ſwoln. In the ſecond, an inflammation without a perfect ſuppuration ſeizes the tonſils, which ſwell and grow hard; a gangrene ſoon enſues, which, if not ſpeedily relieved, proves fatal. See GANGRENE.

In the third ſort, all the nerves are convulſed,

vulfed, and the patient drops down dead fuddenly: however this fpecies of the quinzy, though defcribed by Hippocrates, is yet very rare. If it can be forefeen, it ought to be prevented by evacuations of all kinds; that is, bleeding, purging, bliftering, iffues, and diuretics; and it will be of fervice to practife abftinence, or a moderation in eating and drinking. In the watery-quinzy, which fometimes rages like an epidemic fever efpecially in places near the fea, bleeding plentifully as foon as poffible is recommended; afterwards clyfters, gentle purges, blifters under the chin, and on the fides of the neck; and if this courfe does not fucceed, the palate muft be pretty deeply fcarified about the tongue and fublingual veins.

In thefe inflammations in general, a flight diarrhœa relieves the patient, according to Arbuthnot. Therefore aliments which promote it are of fervice; fuch are tamarinds infufed in whey, decoctions of farinaceous vegetables moderately acidulated, and fuch as abound with a cooling nitrous falt are ufeful. Burnet is faid to be a fpecific in the quinzy; mulberries, and all acids are beneficial. The mouth and throat muft be kept moift, and the nofe clear, that the air may have a free paffage thro' it. Sydenham orders to bleed plentifully in the arm, and Boerhaave directs it to be by a large orifice. Afterwards a fublingual vein fhould be opened; but, according to Hoffman, bleeding in the jugular yields the beft affiftance. If the fymptoms continue to be very urgent, the bleeding may be repeated in fix or eight hours time, till they begin to be more mild. After the firft bleeding, Sydenham orders a ftrong and large blifter to be laid to the neck: then let the parts inflamed be touched with the following mixture. Take honey of rofes, as much as you pleafe; and mix it with as much fpirit of fulphur as is fufficient to give it the greateft fharpnefs. Afterwards the following gargle is to be held in the mouth till it is hot; and is to be repeated pretty often: take plantain-water, and frog-fpawn, of each four ounces; red rofes, four ounces; the whites of three eggs beat in water; and two drams of cryftal fugar.

When the fauces are dry, hot, and the tongue fwells, with difficulty of breathing and fwallowing, Hoffman orders to take of the whites of eggs beat in water, two ounces; water of rofes, one ounce; fal prunella, twelve grains; fyrup of quinces, one ounce. Make a linctus, which is to be taken often; and let the neck be anointed as well behind as before with the following camphorated oil. Take of the oil of fweet almonds, one ounce; oil of white poppies, one dram; camphor, half a dram; after which let the patient take a cooling emulfion.

Boerhaave, after bleeding, orders a ftrong purge, and if that cannot be taken, a ftrong clyfter. Emollient fteams, or even the fteam of hot water taken in at the mouth is beneficial. If the patient is not able to fwallow any nourifhment, take of good broth of flefh-meat, ten ounces; nitre, ten grains; fpirit of falt, fix drops; make a clyfter to be injected every eight hours, and retained as long as is poffible. Hoffman fays, that if the tumour tends to a fuppuration, it is beft promoted by holding dried figs in the mouth, and that when the tonfils are full of an inflammatory ichor, honey of rofes, mixt with fpirit of vitriol, and often applied to the part with a pencil, is excellent. In a latent internal exceeding hot quinzy, the mouth muft be frequently moiftened with milk or cream, with an addition of fal prunella, and fyrup of poppies.

Dr. Pringle obferves, that the inflammatory quinzy is the moft frequent, as well as dangerous among foldiers, upon their firft encampment; and that its tendency to bring on a fuffocation, indicates the neceffity of fpeedy and large bleedings, purging, and bliftering. He alfo recommends the following application, as one of the moft efficacious remedies in this terrible diforder: let a piece of thick flannel be moiftened with equal parts of any common oil and of fpirit of hartfhorn, and applied to the throat, to be renewed once in four or five hours: this medicine, he tells us, he had from Dr. Young, phyfician in Edinburgh. By means of this application, the neck, and fometimes the whole body, is put into a fweat; which, after bleeding, either carries off or leffens the inflammation. He alfo tells us, that he has obferved little benefit arifing from gargles, and that the acid ones did more harm than good: however, a decoction of figs in milk and water, efpecially if the fpirit of fal ammoniac be added, ferves to thin the faliva, whereby the glands fecrete more freely; a circumftance always conducive to the cure.

In the philosophical transactions, the jelly of black currants, swallowed down leisurely in small quantities, is asserted to be a specific for a quinzy; and a decoction of the leaves or bark in milk, when the jelly cannot be had, used as a gargle, is said to cure all the inflammatory distempers of the throat that happen in the winter-time.

In malignant fevers, when there is an inflammation of the oesophagus, Hoffman orders to take nitre, one dram; camphor, three grains; sugar, one ounce; make a powder, which is to be given in an emulsion of sweet almonds, and may also be held in the mouth for some time before it is swallowed. That inflammatory pain which arises from a sharp salt serum in the glandulous parts of the fauces with redness and a copious flux of saliva, but without a fever, may be cured with a gargle of brandy alone. When there is a large defluxion of an impure serous humour upon the fauces, it requires a frequent use of gentle laxatives. When the symptoms of a quinzy are so urgent, that the patient is in immediate danger of strangling, recourse must be had to bronchotomy, or opening of the windpipe. See Bronchotomy.

The method of preventing an inflammation of the uvula, in a prolapsion thereof, from spreading through the fauces and exciting a quinzy, may be seen under the article Prolapsus uvulæ.

QUIRE of paper, the quantity of 24 or 25 sheets.

QUIRISTER, or Choirister, a person appointed to sing in the choir of a cathedral. See Chantor, Choir, &c.

QUIRINALIA, in antiquity, a feast celebrated among the Romans in honour of Romulus, who was called Quirinus. These feasts were held on the 13th of the calends of March.

QUIRITES, in antiquity, a name given to the people of Rome, chiefly the common citizens, as distinguished from the soldiery.

QUIRK, in building, a piece of ground taken out of any regular ground-plot, or floor: thus if the ground-plot were oblong or square, a piece taken out of a corner to make a court or yard, &c. is called a quirk.

QUI-TAM, in law, is where an action is brought, or an information exhibited against a person, on a penal statute at the suit of the king, and the party or informer, when the penalty for breach of the statute is directed to be divided between them; in that case, the informer prosecutes as well for the king as himself.

QUIT-CLAIM, in law, signifies a release of any action that one person has against another. It signifies also a quitting a claim or title to lands, &c.

QUIT-RENT, in law, a small rent that is payable by the tenants of most manors, whereby the tenant goes quit and free from all other services; and it is said to be an acknowledgment, in token of subjection to the lord. Antiently this payment was called white rent, on account that it was paid in silver-coin, and to distinguish it from rent-corn.

QUITTANCE. See Acquittance.

QUITTER-BONE, among farriers, a hard round swelling upon the coronet of a horse's foot, or between the heel and the quarter; sometimes occasioned by gravel under the shoe; or by a bruise, stab, or prick of a nail. This swelling comes to a head in four or five days, and breaks out with matter at a little deep hole, like a fistula.

QUOAD HOC, is a term used in the pleadings and arguments of lawyers; being as much as to say, as to this thing the law is so and so, &c.

QUOD *clerici non eligantur in officio ballivi*, is a writ that lies for a clerk, who, on account of lands he is possessed of, is created bailiff, or some other like officer.

Quod *ei deforceat*, a writ that lies for a tenant in tail, tenant in dower, or for term of life, having lost lands by default, against the person who recovered, or against his heir. It is said, this writ may be likewise brought against a stranger; as where a person recovers by default, and then makes a feoffment of the land; in that case, the feoffee is answerable, &c. and when a tenant in tail, or any tenant that has a particular estate in the lands, loses on a default where he is not summoned, &c. he may have either a disceit or this writ, though his heirs after his death shall not have it, but are to bring a formedon.

Quod *permittat*, in law, a writ which lies for the heir of him that is disseised of common or pasture, against the heir of the disseisor who is dead. And it is held, that where a person's ancestor died seised, or if one be disturbed by another in his common of pasture, or other such thing annexed to his inheritance, he shall have this writ against the deforcer.

Quod *non permittat*. See the article Consuetudinibus.

QUOD *perſona nec prebendarii*, &c. a writ that lies for ſpiritual perſons, when diſtrained in their ſpiritual poſſeſſions, for the payment of a fifteenth, with the reſt of the pariſh.

QUOIL, or COIL, in the ſea-language, a rope or cable laid up round, one fack or turn over another, ſo that it may the more eaſily be ſtowed out of the way, and aſo run out free and ſmooth, without twiſtings or doublings.

QUOIN, or COIN, on board a ſhip, a wedge faſtened on the deck cloſe to the breech of the carriage of a gun, to keep it firm up to the ſhip ſide.

Cantic quoins are ſhort three-legged quoins put between caſks to keep them ſteady.

QUOINS, in architecture, denote the corners of brick or ſtone walls. The word is particularly uſed for the ſtones in the corners of brick-buildings. When theſe ſtand out beyond the brick-work, their edges being chamfered off, they are called ruſtic quoins.

QUOITS, a kind of exerciſe or game known among the antients under the name diſcus. See the article DISC.

QUO JURE, in law, a writ that lies where a perſon has lands in which another claims common of paſture time out of mind; and it is brought in order to compel the perſon to ſhew by what title he challenges the common.

QUO MINUS, is alſo a writ which iſſues out of the court of exchequer to the king's farmer or debtor, for debt, treſpaſs, *&c.* Though this writ was formerly granted only to the king's tenants or debtors, the practice now is become general for the plaintiff to ſurmiſe, that by the wrong the defendant does him, he is the leſs able to ſatisfy his debt to the king, by which means juriſdiction is given to the court of exchequer to determine the cauſe. This writ is to take the body of the defendant in like manner as the capias in the common pleas, and the writ of latitat in the king's bench.

QUORUM, a word frequently mentioned in our ſtatutes, and in commiſſions both of juſtices of the peace and others. It is thus called from the words of the commiſſion, *quorum* A. B. *unum eſſe volumus.* For an example, where a commiſſion is directed to ſeven perſons, or to any three of them, whereof A. B. and C. D. are to be two; in this caſe, they are ſaid to be of the quorum, becauſe the reſt cannot proceed without them: ſo a juſtice of the peace and quorum is one without whom the reſt of the juſtices in ſome caſes cannot proceed.

QUOTATION, in literature, a citation, or paſſage, rehearſed expreſsly in one author from another.

Quotations are uſually diſtinguiſhed by inverted commas.

QUOTIDIAN, *quotidiana*, in medicine, an intermitting fever, or ague, the paroxyſm or fit whereof returns every day. See the article INTERMITTENT.

This ſpecies of intermittent fevers is not ſo common as the tertian and quartan. See TERTIAN and QUARTAN.

It attacks the patient early in the morning, with chilneſs and ſhivering; to which ſucceed a cardialgia, nauſea, and inflation of the belly; in ſome a pain in the head, in others fainting fits, and in moſt vomiting or ſtools, or both; after which comes on the hot fit, with thirſt. As to the cure, the beſt method ſeems to be firſt to attenuate the tough and vitiated humours in the ſtomach and inteſtines, by proper doſes of vitriolated tartar, and the like; after which a gentle emetic, diaphoretics and diluents are to be adminiſtered; and laſtly, the bowels are to be ſtrengthened by bitters and ſubaſtringents; among which, the peruvian bark claims a place, only to be uſed in ſmaller quantities than when truſted to alone for the cure.

QUOTIENT, in arithmetic, the number which ariſes by dividing the dividend by the diviſor. See DIVISION.

QUO WARRANTO, in law, a writ which lies againſt a perſon or corporation, that uſurps any franchiſe or liberty againſt the king; as to have a fair, market, or the like, in order to oblige the uſurper to ſhew by what right and title he holds or claims ſuch franchiſe.

This writ alſo lies for miſ-uſer, or non-uſer of privileges granted.

The attorney-general may exhibit a quo-warranto in the crown-office againſt any particular perſons, or bodies politic or corporate, who uſe any franchiſe or privilege, without having a legal grant, or preſcription for the ſame; and a judgment obtained upon it is final, as being a writ of right.



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